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OPEN HEART SURGERY: BASIC PHYSIOLOGIC PRINCIPLES AND CLINICAL APPLICATION IN CONGENITAL HEART DISEASE *

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Although effective surgical methods for dealing with certain cardiac disorders had been developed previously, the introduction of controlled cross-circulation by Lillehei and associates [7] made open heart surgery possible for the first time. Subsequent development of safe and effective artificial oxygenators afforded a more practical method for achieving cardiopulmonary by-pass.[3, 4] Sufficient experience has now accumulated with these heart-lung machines to demonstrate their clinical usefulness in operations upon the heart. This report is concerned with the basic principles, techniques, and some of the physiologic changes encountered in the use of the bubble oxygenator, and to indicate the application of these basic principles to congenital heart disease.

BASIC PRINCIPLES

Oxygenation of blood. During the time when the heart and lungs are excluded from the circuit, sufficient oxygenated blood to sustain life must be delivered to the body. Oxygenation of blood has been accomplished by three basically different methods: donor oxygenation, homologous lung or biologic oxygenation, and artificial or mechanical oxygenation.

Donor oxygenation: This principle involves collecting arterial blood from multiple donors in several reservoirs or employing the technique of cross-circulation whereby donor and patient are connected by vein-to-vein and artery-to-artery cannulations with the flow controlled by mechanical pumps.

Biologic oxygenation: This principle involves pumping a controlled amount of the recipient's venous blood into the common pulmonary artery of a set of lungs removed from an animal. The lungs are ventilated with 100 per cent oxygen which is delivered through a cannula into the trachea. The oxygenated blood is allowed to flow freely into a reservoir from the pulmonary veins and is pumped back into the arterial tree of the recipient.[2]

Mechanical oxygenation: Many ingenious methods have been designed for the artificial oxygenation of blood. The most commonly used methods at present employ two different principles. The "film" oxygenator allows venous blood to be spread out very thinly on a screen, either stationary or on a moving drum, in an atmosphere of oxygen. Carbon dioxide escapes according to the law of partial pressures and oxygen is picked up by diffusion. In the "bubble type" method, oxygen is introduced directly into a column of blood through very fine apertures, excess oxygen and carbon dioxide leave

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the system as the blood flows down a gradual incline into the collecting system.

To date, clinical experience at Tulane has been limited to the "bubble type" oxygenator but a newly acquired film type machine is now being employed.

Principles of flow. Given a method by which blood can be oxygenated effectively, some basic point of reference of volume of blood flow as it relates to life is essential for its intelligent application. Regardless of the method of oxygenation selected, a clear understanding of the fundamental relationship of volume flow to life under the altered conditions imposed by cardiac surgery is essential. This relationship was clearly demonstrated by experiments of Andreasen and Watson. They found that if the superior and inferior vena cavae and the azygos vein were excluded, all animals died within five to eight minutes; however, if the azygos vein was left open, all animals recovered promptly after thirty minutes of occlusion of the cavae.[1] The amount of flow through the azygos vein was found to be adequate for survival for thirty minutes if the heart was not manipulated. This flow was carefully measured and found to be 5 to 9 cubic centimeters per kilogram body weight per minute. These investigators and others have shown that as the volume of flow was increased above the azygos flow rate the percentage of ventricular fibrillation, resulting from trauma to the heart, decreased and that at volumes of flow from three to four times the azygos flow rate, opening the heart was quite safe.[6]

This low flow principle has been extensively applied clinically and actually was the basis for the first successful series of intracardiac repair of congenital heart lesions under direct vision using an extracorporeal system. However, as clinical experience increases, evidence is found to support the opinion that the volume of flow should be greater, especially in infants. The volume of oxygenated blood returned to the patient is entirely dependent upon the amount that can be recovered from the superior and inferior vena cavae. This amount varies with each patient. Continuous monitoring of the pressure in the inferior vena cava and maintaining this pressure at near normal levels is considered a reliable indication as to the adequacy of the volume of flow:

Incision and cannulations. Methods of cannulation for the withdrawal of venous blood and its return to the body as oxygenated blood varies. Basically, however, the venous blood is picked up through two cannulae which have been introduced through the appendage of the right atrium into the superior and inferior vena cavae respectively. Occluding tapes passed around the cavae insure complete venous "pick up" when the machine is in operation. The oxygenated blood can be returned to the body via any large artery. The right common femoral is preferred because it can be easily repaired and the the cannula is away from the operative field. These cannulations can be made through a standard thoracotomy incision in the right fourth interspace. However, for work in the right ventricle it is necessary to do a bilateral thoracotomy with a trans-sternal incision. To prevent clotting in the cannulae and in the machine, the patient is heparinized prior to the insertion of the cannulae and the donor blood to fill the machine is collected in heparin. At the conclusion of the procedure, protamine sulfate is given intravenously to counteract the effect of the heparin.

During the time the heart is open, blood perfuses the coronaries and empties into the right heart through the coronary sinus, thebesian veins, and atrioluminal vessels. This volume may be as much as 25 per cent of the entire flow and must be returned to the oxygenator directly.[3]

A motionless heart is desired for the repair of ventricular septal defects. Cardiac arrest is produced by cross-clamping the ascending aorta and injecting a solution of potassium citrate proximal to the clamp to perfuse the coronary arteries. Cardiac standstill can be safely maintained for at least thirty minutes. When

the clamp is removed the coronaries are perfused with oxygenated blood, the potassium is washed out and normal rhythm ensues.

Closure of the intracardiac defect is accomplished by apposition of the edges of the defect with either interrupted or running sutures. If the defect is too large to permit approximation, a patch of compressed polyvinyl sponge is sutured to the edges of the defect. This plastic patch is inert and serves as a scaffold upon which endothelial cells grow. It remains as a permanent structure within the heart.

PHYSIOLOGIC CHANGES

Blood pressure. During the period of cardiopulmonary by-pass the blood pressure declines to 60-70 mm. of hg. but usually returns to preoperative levels when the normal circulation is restored. The pressure is not necessarily related to the volume of flow.

Experience has indicated that volume of flow and not blood pressure is the more important factor.

Electrocardiogram. Following perfusion and cardiotomy there is usually no significant change in the electrocardiogram.[8]

Body temperature. Despite the fact that oxygenated blood passes through a water bath there is a tendency to hypothermia during the procedure. The temperature is constantly recorded and controlled by a thermal mattress.[8]

Metabolic changes. In general there is a tendency to metabolic acidosis while the patient is being maintained on the mechanical oxygenator.[5, 6] In those patients in whom the volume of flow more closely approximates the normal cardiac output this tendency is less than in those who have a lower volume flow. Metabolic acidosis is quickly corrected when the normal circulation is restored.

Respiratory alkalosis, due to an excessive amount of carbon dioxide leaving the blood plus the altered respiration as a result of thoracotomy, may be a significant factor.[8]

There is no appreciable change in serum potassium, sodium or chloride. Blood urea nitrogen is essentially unchanged.[8] There is a transient drop in platelets and leukocytes which reverts to normal within a few hours.[8] Hemolysis is minimal and the clotting mechanism returns to normal following the administration of protamine.[8]

Clinical application. To date, extracorporeal circulation has been used at Tulane in the repair of interatrial and interventricular septal defects and in one case of complete transposition of the great vessels. The oxygenator has been used successfully in closure of an acquired interventricular septal defect and in aneurysms of the ascending aorta. Severity of the cardiac lesion, pulmonary arterial pressure, the presence or absence of heart failure and size of the patient are of critical importance in the success or failure of the procedure. Increasing experimental and clinical experience helps to solve certain problems related to the use of extracorporeal circulation, making the procedure safer and applicable to a variety of cardiovascular disorders.

SUMMARY AND CONCLUSIONS

Mechanical heart-lung by-pass utilizing extracorporeal circulation makes possible the repair of certain intracardiac defects as well as acquired lesions of the aortic arch. With these "heart-lung machines" flows of 50 to 100 per cent of cardiac output are possible. Although slight metabolic changes may occur, these are not serious and can be easily corrected.

Employing a bubble-type oxygenator we have successfully repaired defects of the atrial and ventricular septa. These techniques are applicable to a variety of cardiovascular disorders.

REFERENCES

1. Andreasen, A. T. and Watson, F.: Brit. J. Surg., 41: 195, 1954.
2. Campbell, G. S.; Crisp, N. W., Jr., and Brown, E. B., Jr.: Proc. Soc. Exper. Bio. & Med., 88:390, 1955.
3. Kirklin, J. W. et al: Ann. Surg., 144:2 (July) 1956.
4. Kirklin, J. W. et al: Proc. Staff Meet. Mayo Clin., 30:105, 1955.
5. Spreng, D. S., Jr. et al: Surg. Forum. Am. Coll. Surg., 3:165, 1952.
6. Warden, H. E. et al: J. Thorac. Surg., 28:331, 1954.
7. Warden, H. E. et al: Surg. Forum. Am. Coll. Surg., 5:22, 1954.
8. Personal unpublished data.

SURGICAL TREATMENT OF CERTAIN AORTIC DISEASES *

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Until recent years, surgical methods of combatting man's greatest killer, arteriosclerosis, have not been generally used. With the fantastic advances in vascular surgery during the last decade, the medical challenge of arteriosclerosis involving major vessels has been met by surgeons with most encouraging results. That operation is not the solution to arteriosclerosis is obvious, but early detection of some of its pathological processes has resulted in rehabilitation and conservation of life and limbs in many instances.

Contrary to popular opinion, arteriosclerosis is not a generalized process; its lesions are scattered and segmental. Commonly affected is the terminal aorta, where two diseases occur with increasing frequency: arteriosclerotic occlusion and arteriosclerotic aneurysm.

OCCLUSIVE AORTIC DISEASE

The intimal changes associated with arteriosclerosis in this region may be due in part to mechanical factors, including eddy currents in the blood stream. Once present, the arteriosclerotic changes become progressively worse. Accumulation of lipids in the intima, with subsequent thickening, disorganization of elastic tissue, accumulation of calcium, and plaque formation, is followed by ulceration and formation of small thromboses. The walls of the vessels thicken, and the size of the lumen progressively diminishes. Ultimately, increased thrombosis leads to total occlusion. Proximal to the occlusion, a slowly progressive thrombosis ascends up to the point at which the next major vessel arises, the renal artery. Distal to the occlusion, further gradual thrombosis descends again, usually to the point of the next major branch. Whether the process commences in the iliac vessels and ascends or has its initiation at the bifurcation is speculative.

Terminal aortic occlusive disease has been recognized as a clinical syndrome since Leriche's [11] original description of it in 1923. The disease is common in the fifth and sixth decades of life, although persons in their late twenties and early thirties may have extensive occlusion. This may be total or incomplete, may be strictly localized to the bifurcation, or may rarely lie between the bifurcation and the renal vessels. Commonly, the bifurcation, with varying portions of one or both iliac arteries, is involved. The characteristic symptoms, which are due to ischemia, are intermittent claudication in the thigh, buttocks, hips, or low part of the back. Frequently, the neurosurgeon or orthopedic surgeon is, therefore, first consulted. Impotence is a frequent complaint when occlusion is extensive, although this is not invariably so. Trophic changes in the skin of the lower extremities are conspicuously absent. The diagnosis is confirmed by the presence of weak or absent femoral pulsations, frequently associated with a soft systolic murmur heard over the lower abdominal or inguinal regions. Hypertension is common when occlusion is complete. Lumbar aortography will confirm the presence and extent of the disease.

Surgical treatment: Surgical treatment of occlusive aortic disease is directed at restoration of normal blood flow to the extremities. A number of procedures may accomplish this result: (1) resection of the terminal aorta and occluded branches, with replacement by graft, (2) localized thrombo-endarterectomy or resection of only the inner layer of the occluded segments, with reconstruction of the relatively normal outer layers of the vessel, (3) utilization of a bypass graft from normal areas of aorta to normal distal

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vessel, the occluded segments being left intact in their normal position. By this method, collateral circulation that has already been established remains virtually undisturbed. Restoration of normal circulation with reconstruction of arterial continuity, with or without excision of diseased vessels, offers the only possibility of retarding the disease. Excessive conservatism is to be condemned. Circulation must be established to a relatively normal degree well below the point of occlusion, often as low down as the superficial femoral artery. If the obstruction is localized above the inguinal ligament, with relatively normal distal vessels and good back flow, excellent operative results can be expected in more than 90 per cent of patients, frequently with return of sexual potency.

AORTIC ANEURYSMS

Aneurysms of the aorta are generally classified as arteriosclerotic or syphilitic (Figures 1 and 2). Arteriosclerotic aneurysms are usually fusiform and may occur anywhere in the aorta, whereas the syphilitic variety is usually saccular and is confined to the thoracic aorta. In the abdominal aorta, arteriosclerotic aneurysms are usually elongated, and more than 90 per cent are located below the renal arteries.

Abdominal Aneurysms: About 30 per cent of abdominal aneurysms give rise to no symptoms prior to leakage or rupture. Pain in either the back or the abdomen is the commonest complaint apart from the ever present pulsating mass, especially notable while the patient is lying flat. This mass is located in the upper left section of the abdomen because, although it is generally unrecognized, the aortic bifurcation lies at the level of the umbilicus, the renal vessels lying beneath the rib cage at the level of the xiphoid. Tenderness over the mass and loss of weight are characteristic. Whereas symptoms due to pressure are not usually associated with these aneurysms, they may accompany significant sequelae of duodenal and jejunal compression as well as lumbar vertebral erosion.

Figure 1—Tremendous aneurysm of the aortic arch.

Figure 2—Saccular aneurysm of the ascending arch, possibly amenable to excision by aortic suture technic.

Rupture of the aneurysm or preliminary leakage is associated with severe pain, which radiates through to the back and down into the inguinal regions. The mass usually leaks into the retroperitoneal space, but it may rupture into the duodenum or upper gastrointestinal tract and thus render the diagnosis considerably more difficult. Shock in varying degrees, depending on the rate of blood loss, occurs with progressive abdominal distention. Leukocytosis is present in about 50 per cent of patients. Although these are usually described as ruptured aneurysms, most aneurysms actually leak slowly, for

hours, days, or even weeks, before rupture, massive hemorrhage, and death occur. A leaking or ruptured aortic aneurysm must be recognized as a dire emergency if any salvage is to be attained.

The mere presence of symptoms is of serious prognostic significance, since the average duration of life after their onset is not usually more than three years. In Estes's [10] series of 97 arteriosclerotic aneurysms, 25 per cent of the patients were dead from rupture within one year, 50 per cent within three years, and all within ten years after the diagnosis was made. Crane [7] emphasized that 82 per cent of the patients with aneurysms larger than 7 cm. in diameter were dead from rupture within six months after establishment of the diagnosis. In those patients whose aneurysms were less than 6 cm. in diameter, he found the danger of leakage to be extremely rare. Ample opportunity exists for surgical intervention in most patients with leaking aneurysms, since 25 per cent usually live at least six to eight hours before the occurrence of massive or terminal hemorrhage. With prompt diagnosis and surgical intervention, a salvage rate of 50 to 60 per cent can be achieved.

Surgical treatment: Removal of the mass prior to rupture, with restoration of blood flow through a graft, is the only logical form of therapy in the absence of definite contraindications, such as serious renal or cardiac disease. Few aneurysms are technically nonresectable, and involvement of the renal vessels no longer constitutes contraindications, as evidenced by the remarkable fatality rate of about 2 per cent obtained by DeBakey and associates.[6, 8, 9] Despite the serious risk of operation in patients with leaking or ruptured aneurysms, resection should be attempted in view of the otherwise hopeless prognosis.

Aneurysms larger than 7 cm. in diameter or those associated with symptoms are generally considered to be indications for surgical intervention (Figure 3) but opinion is divided regarding treatment of

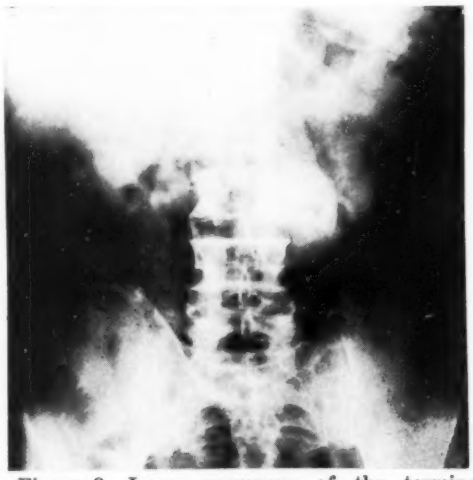

Figure 3—Large aneurysm of the terminal aorta — amenable to excision and replacement graft.

small asymptomatic abdominal aneurysms. No less a vascular authority than Michael Boyd [4, 7] of Manchester believes that asymptomatic aneurysms should not be treated surgically, especially in elderly patients. Admittedly, all patients with abdominal aneurysms are not necessarily candidates for operation; careful periodic re-examination of this group should be carried out, and operation should be advised at the first development of symptoms. Hypertension, pre-existent cardiac disease, and advanced age will influence the case fatality rate, since the risk incident to resection in these patients is considerably greater.

Technic of resection: Spinal and hypotensive anesthetic methods are proposed by some surgeons, but I have found general anesthesia, with adequate relaxation, to be far more satisfactory. The incision is made from the xiphoid to the pubis, and the peritoneal cavity is entered. The entire small intestine is retracted upward and to the right. The posterior peritoneum is incised along the root of the mesentery, the ligament of Treitz is divided, and the duodenum is mobilized. Because of the intense inflammatory reaction surrounding aneurysms, loops of intestine, duodenum or ureter, may be firmly adherent to the mass. Prior to

any mobilization of the pulsating tumor, tapes should be placed around the aorta, above the aneurysm, and below, around the iliac vessels. Preceding actual excision, the aneurysm should not be extensively manipulated because of the danger of dislodging necrotic wall or thrombus into distal arteries. When the aorta above and the vessels below have been occluded, division should be made below the mass, and resection should be accomplished from below upwards, the lumbar vessels being ligated and divided. Particular care is required in dissection of the aorta from the vena cava (Figure 4). When it is densely adherent, the aneurysm should be opened, the clot should be evacuated, and that portion of the wall attached to the cava should be left in place rather than further dissection being attempted in this obliterated plane. Because the left renal vein is so frequently obscured by fat and fibrous tissue, particular care must be exercised to avoid injury to this vessel.

Figure 4—Drawing of terminal aortic aneurysm. Right iliac artery is dilated. Bifurcation graft is necessary.

When the aneurysm has been removed, a graft of suitable length should be selected (usually of the bifurcation type since the origins of the iliac artery are most commonly involved), and anastomosis should be begun. A simple over-and-over suture, with the use of 3-0 silk for the proximal aortic end and 4-0 silk for the iliac arterial end, is satisfactory. Whereas the period of aortic occlusion below the renal artery is of lesser importance in occlusive disease with an already established collateral circulation, early restoration of blood flow after resection of the aneurysm is desirable. Periods of occlusion up to 140 minutes, however, appear to be well tolerated without serious ischemic changes in the lower extremities.

Complications: The complications of aortic resection may be: (1) operative, (2) thrombotic and embolic, (3) ischemic, or (4) renal.

(1) Operative Complications: Injury to the vena cava, left iliac vein, which underlies the bifurcation, or left renal vein may lead to obstinate hemorrhage. Since attempts to clamp these vessels are especially dangerous, hemostasis should be attained with pressure and suturing of the rent with 6-0 silk. The left ureter may be divided or injured during freeing and mobilization of large aneurysms, as this structure is frequently densely adherent and deviated from its usual course. Prompt recognition and repair are imperative.

Adequate attention to hemostasis is essential, especially from oozing middle sacral or lumbar vessels, possibly obscured by the replacement graft. Hemorrhage from the suture holes at the anastomotic line can generally be controlled by slight pressure with gauze sponges; occasionally, a defective suture may require additional reinforcement. The anastomosis should be doubly checked after flow of blood has been re-established for a reasonable period of time.

Tearing and fracture of the aorta may occur from too tightly occluding clamps, especially in the presence of a hardened arteriosclerotic vessel. For this reason, a tape placed well above the site of occlu-

sion, preferable above the renal artery, is strongly advocated as a safety measure for control of hemorrhage.

(2) Thrombotic and embolic complications are, unfortunately, still too common following aortic grafting procedures. These may occur from plaques, loosened during thrombo-endarterectomy proximal to the anastomosis, from inadequate flushing out of the proximal vessels, or from formation of a clot in the vessels distal to the lower clamp. Frequent loosening of the clamp to allow the vessels to bleed and flush out clots should obviate much of this danger. Early thrombosis and occlusion of the graft are becoming more common as the use of plastic material becomes more popular, the clot often commencing and progressing from the proximal anastomosis. A vigorous flow of blood through the graft is the best insurance against thrombosis, and every effort must be made to insure adequate blood pressure after continuity is re-established. Patients with early loss of pulsations in one or both extremities after operation must be re-explored promptly, with removal of the thrombus or replacement of the graft. Most postoperative thromboses occur before the patient leaves the operating room or within the first few postoperative hours.

(3) Ischemic complications: In addition to ischemic complications that result from failure of the graft, poor peripheral vessels or distal thrombosis, the blood supply of the rectosigmoid may be prejudiced from division of the inferior mesentery and hemorrhoidal arteries. Gangrene of the intestine has, in rare instances, followed aortic grafting. If the intestine appears to be dusky and the state of viability is questionable, a loop colostomy, with exteriorization of the intestine, is recommended at the time of the primary procedure.

(4) Renal complications have been responsible for a considerable proportion of deaths after aortic grafting. Lower nephron nephrosis, involvement of the orifices of the renal arteries with arteriosclerotic plaques or thrombosis, and prolonged hypotension are all contributing factors. In two of my patients, bilateral massive thrombosis of the renal artery occurred, with death from renal failure seven days after an otherwise successful grafting procedure. In both instances, thrombosis was attributable either to fresh formation of a clot at the site of denuded intima at the orifices of the renal vessels or possibly to debris flushed into the renal vessels during manipulation of the aorta. When the aorta is extensively involved, with thrombosis up to the origin of the renal arteries, extreme care must be observed during thrombo-endarterectomy in the region of the aorta adjacent to the renal arteries to avoid this insidious and often fatal complication.

Aneurysms of the Thoracic Aorta: These aneurysms may be saccular or fusiform and may develop anywhere from the origin of the aorta to the diaphragm. Their prognostic significance is greater than that of abdominal aneurysms. They are associated with symptoms due to pressure, primarily pain, cough, dysphonia, dysphagia, and erosion of bone. The average duration of life after onset of symptoms is about six to nine months.

Surgical treatment: The surgical treatment of these aneurysms is directed toward: (1) reduction of lateral pressure on the weakened portion of its wall or (2) complete excision of the diseased aorta and aneurysm, with subsequent restoration of blood flow. The weakened portion is excised after occlusion of the neck of the aneurysm with suitable clamps, and lateral repair of the aorta is carried out by suture of the neck (Figure 5). This procedure, so adequately described by Bahnson [2, 3] in the treatment of saccular aneurysms, is successful because syphilitic saccular aneurysms often have a narrow neck, which facilitates the application of clamps and enhances the tenacity of sutures. Furthermore, despite the widespread syphilitic changes in the wall of the aorta, the base of the aneurysm is tough and leathery and is strong

Figure 5—Excision by aortic suture technic, as advocated for saccular thoracic aneurysm possessing narrow neck.

enough to hold both the occluding clamp and sutures satisfactorily.

For aneurysms with a wide neck inaccessible to successful application of clamps, such as the arch of the aorta, excision with reconstruction of continuity through a graft is preferable.[6, 9] Because serious consequences may follow even rather brief periods of occlusion of the thoracic aorta, methods of bypassing the occluded area must be used during resection. A temporary shunt through a bypass graft, with ingenious lesser shunts to carry circulation through the carotid arteries, is being used successfully. Hypothermia and temporary hypotensive anesthetic methods are valuable adjuncts during any procedure that requires thoracic aortic occlusion. The entire aortic arch has been successfully replaced, and prolonged periods of occlusion of the thoracic aorta are now possible when temporary shunts are used. Although the danger of interference with the supply of blood to the spinal cord is not great, some instances of paraplegia after thoracic aortic resection have been reported.[1] Surgeons should be reminded that the supply of blood to the thoracic spinal cord is both poor and inconstant, so that ligation of only a few pairs of intercostal arteries may lead to severe ischemic changes in the spinal cord.

Whereas the risk associated with operative correction of aneurysms of the thoracic aorta is appreciably high (about 30 per cent in most series), nonsurgical treatment of this "malignant disease" is universally fatal. As experience with newer technics increases, results will undoubtedly improve. It is in this particular field that some of the most brilliant technical achievements have been accomplished in the field of vascular surgery during the past few years.

SUMMARY AND CONCLUSIONS

Resection of the aorta has been performed in several hundred patients with an average case fatality rate of approximately 10 per cent, although in DeBakey's recent series there was a remarkable fatality rate of only 2 per cent. A sufficient number of operations has now been performed to demonstrate relief of symptoms, rehabilitation, and prolongation of life.

Most complications consequent to resection of the aorta, either for aneurysm or occlusive disease, are related to extensive distal arteriosclerotic disease, coexistent cardiac or renal disease, or interference with blood supply to the spinal cord or intestine. Development of readily available and more satisfactory plastic prostheses has made the surgical treatment of leaking or ruptured abdominal aortic aneurysm an emergency operation. A salvage rate of about 50 per cent has been achieved in patients who would otherwise have had certain early death. With increasing awareness of the clinical status of these patients and earlier operation, even greater success in surgical treatment can be anticipated.

REFERENCES

1. Adams, H. D. and Van Gertruyder, H. H.: Neurological complications of aortic surgery, Ann. Surg., 144: 574, 609, Oct. 1956.

2. Bahnson, H. T.: Definitive treatment of saccular aneurysms of the aorta with excision of sac and aortic suture, Surg., Gynec. & Obst., 96:383, 1953.

3. Bahnson, H. T.: Considerations in the excision of aortic aneurysms, Ann. Surg., 138:377, 1953.

4. Boyd, A. M.: Cited by Bremer.[5]

5. Bremer, J. K.: Aneurismas van die aorta en ander slagere, S. A. Tydskrif vir. Geneeskunde, 31:211-220 (March 9) 1957.

6. Cooley, D. A., Mahaffey, D. E., and DeBakey, M. E.: Total excision of thoracic aortic arch for aneurysm, Surg., Gynec. & Obst., 101:667 (Dec.) 1955.

7. Crane, C.: Arteriosclerotic aneurysms of the abdominal aorta, New England J. Med., 253:954 (Dec. 1) 1955.

8. De Bakey, M. E., Cooley, D. A., and Creech, O., Jr.: Treatment of aneurysms and occlusive disease of aorta by resection. Analysis of 87 cases, J.A.M.A., 157:203, 1955.

9. De Bakey, M. E. and Cooley, D. A.: Successful resection of aneurysms of distal aortic arch and replacement by graft, J.A.M.A., 155:1398 (Aug. 14) 1954.

10. Estes, J. E., Jr.: Abdominal aortic aneurysms. Study of 102 cases, Circulation, 2:258, 1950.

11. Leriche, R.: Des oblitérations artérielles hautes (oblitérations de la terminaison de l'oarte) comme cause des insuffisances circulatoires membres inférieurs, Bull. et Mem. Soc. Chir. de Paris, 49:1404, 1923.

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GASTRECTOMY FOR BLEEDING PEPTIC ULCER IN A 30-MONTH-OLD CHILD

WITH RECOVERY COMPLICATED BY ADRENAL HYPOFUNCTION

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The following case report is presented for several reasons: (1) to add another instance of gastric resection for ulcer to the limited number now on record in which surgery of such magnitude was required in a very young child; (2) to demonstrate the ability of a very young child to compensate for the loss of over half of the stomach, as indicated by his nutritional status, growth and development in the two years following operation; and (3) to draw attention briefly to a postoperative adrenal dysfunction, which is being reported in greater detail elsewhere.

CASE HISTORY

A 2½-year-old boy was admitted to Hotel Dieu, December 12, 1954, after a six day illness characterized by sore throat, fever, and vomiting. There had been no response to antibiotic therapy, and dehydration had become increasingly serious.

He was the second child of healthy parents and had a negative past history. The older child had died at the age of 4½ years, after an illness of four days. This child's illness later assumed considerable significance.

On admission, the patient's temperature was 99.2° F., the pulse 90, and the respiration 20. He seemed acutely ill and complained repeatedly of thirst and pain in his throat and mouth. Positive physical findings consisted of swelling and reddening of the lips, gum and tongue, acute pharyngitis and acute tonsilitis. The abdominal examination was negative. At this time the hemoglobin was 15 gm. per cent, the white blood cell count 13,400 per cubic millimeter, and the CO_2 combining power of the blood 23 volumes per cent.

The child's condition improved under infusions of glucose in physiologic salt solution with molar sodium lactate in appropriate amounts, fluids by mouth, and tetracycline (100 mg. every eight hours) until the fifth day of hospitalization, when he suddenly passed a large tarry stool and went into shock. Shortly afterward the abdomen became slightly distended, but there was no rigidity and only questionable tenderness. He responded well to supportive measures, including a transfusion of 250 cc. of whole blood. A mild reaction was controlled by the injection of 50 mg. of ACTH and 1 cc. of benadryl. The hemoglobin value immediately after the passage of the tarry stool was 7.8 gm. per cent. Several hours later, after the

measures described, the hematocrit determination was 40.

The child continued to progress well for the next twenty-four hours. A gastrointestinal study and barium enema done some hours after the hemorrhage revealed no organic disease of the upper tract or lower bowel.

Late in the afternoon of the following day the patient suddenly vomited a large quantity of bright red blood and again went into shock. Prompt improvement again followed standard supportive therapy, supplemented by a transfusion of 500 cc. of whole blood. An oxygen tent was used, and suction was instituted by means of a Levin tube in the stomach. Hematocrit determinations ranged from 41 to 60. Surgery was considered at a consultation, but in view of the good response to treatment and the absence of additional bleeding it was decided to continue conservative treatment for the present.

Progress was again satisfactory for the next four days. The child was kept under continuous strict observation. On the afternoon of the fifth day (December 22) bright red blood began to appear in the drainage fluid, and he was immediately prepared for surgery. The hematocrit was 40 at the beginning of the operation.

Exploration was carried out under general anesthesia (nitrous oxide, vinesthene, ether). There was no evidence of bleeding in either the ileum or the colon and no evidence of any other abnormality in these areas. The upper portion of the jejunum was full of dark blood, and the duodenum was edematous and thickened, these changes extending into the pyloric end. Careful examination of the stomach through a gastrotomy incision revealed no point of bleeding. When the duodenum was opened, blood welled up into the operative field, apparently from an area about at the junction of the first and second portions. When it was finally controlled by the application of several ligatures the source was found to be an ulcer on the posterior wall, about 5 cm. from the pylorus.

The location of the ulcer obviously precluded the use of the duodenum in any anastomotic procedure, and an attempt at dissection of the lesion was considered unwise, if only because it would increase the operating time. It was therefore decided to perform gastrectomy, leaving the ulcer in situ. The Hofmeister technique was employed, and subtotal gastrectomy was performed without incident after the stump of the duodenum had been closed. A later gastrointestinal series revealed that almost two-thirds of the stomach had been removed.

The child's condition was fairly good at the conclusion of the operation and there was no untoward incident for the first forty-eight hours. The rectal temperature was between 102 and 104° F., the pulse ranged between 90 and 120, and the hematocrit readings ranged from 33 to 36. Peristalsis was audible on the third day. The Levin tube was therefore clamped off at intervals and fluids were begun by mouth. The tube was removed on the seventh postoperative day. By this time, the child had normal temperature and was receiving a full bland diet.

In view of the previous stormy course, it was thought best to continue hospitalization, and the precaution proved wise. Progress was uninterruptedly good until January 5, 1955, the fourteenth day after operation, when there was a sudden attack of vomiting (without blood), an elevation of temperature to 103.2° F., and recurrence of the shock-like state which had attended previous episodes before operation. An infusion of glucose in physiologic salt solution containing 100 mg. of cortisone was given as a slow drip in the amount of 700 cc. and was followed by 500 cc. of whole blood. Later an infusion containing 100 cc. of calcium gluconate was given.

The response to these measures was highly satisfactory. No cause for the episode was apparent. There were recurrences on January 11 and February 3. Response to therapy was good both times.

Meantime, vigorous efforts were made to establish a diagnosis. All laboratory studies were negative, including urinalyses, blood agglutination tests, blood cultures, cultures of secretions from the nose and throat, an electrocardiogram, and roentgenologic studies to establish the bone age. Fluoroscopic and roentgenologic studies of the chest were negative; there was nothing to suggest the presence of a subphrenic abscess. Barium studies of the upper gastrointestinal tract revealed normally functioning anastomotic stoma without evidence of marginal ulcer or any other pathologic process.

The diagnosis was finally made by a combination of clinical and laboratory observations which indicated that the child was suffering from adrenal hypofunction with the salt-losing syndrome. These data included the development of pigmentation; the tendency to exhibit a shock-like state without evidence of hemorrhage; a craving for salt; a low blood sodium (123 mg. per cent); and an elevated blood potassium (6.3 mg. per cent). The 17-ketosteroids were within the normal range. Once it became evident in the postoperative period that this patient's shock-like episodes were not the result of hemorrhage, attention was directed to a possible adrenal cause. It was also recollected that the older brother's fatal illness had been associated with shock. When the parents were questioned further, they recalled that this patient's episodes resembled the episode in which the older brother had succumbed. The autopsy

report, obtained from Charity Hospital of Louisiana at New Orleans, indicated that no adrenal tissue could be located at all. In both children it seemed apparent that the adrenal hypofunction was on a congenital basis.

As soon as the diagnosis was established, percorten therapy (desoxycorticosterone-acetate) was instituted. Improvement was prompt and continuous. There were no further attacks of vomiting and shock, and when the child was discharged from the hospital March 1, his weight, which had fallen to 21 pounds, had reached the pre-illness level of 26 pounds.

Periodic checks on this patient during the two years since his illness have been gratifying. There has been no retardation of growth, no perversions of the nutritional status, and no abnormalities of blood balance. His present weight is 45½ pounds. His nutritional status is excellent. He eats normal amounts of food at regular meals and frequently eats between meals. Repeated blood counts have been within the normal range. A bone age study November 12, 1956, gave results consistent with the child's chronologic age.

REVIEW OF THE LITERATURE

The incidence of peptic ulceration in infants and children, particularly the type of ulceration which requires surgical intervention, has been discussed in several papers. Perhaps the best is an excellent collective review of the literature by Bird, Limper and Mayer,[1] in 1941. Of the 119 operations which they were able to find, 53 were for pyloric stenosis, 43 for perforation, and 12, as in my own case, for hemorrhage. The age range in this series was from 34½ hours to 15 years; the condition has been reported in utero. There were 17 gastroduodenal resections in the 119 operations, with two deaths, one in a child under 2 years of age and the other in the 12-15 year group.

In 1952, McAleese and Seiber[2] collected another 29 surgical cases of peptic ulceration in children. The single gastrectomy in the group was reported by Karlstrom, in 1949; the child survived. There were two instances of local excision of anterior accessible ulcers, both reported by Plummer and Stabins,[3] in 1950; both children survived. In 1955, Neilson and Black[4] reported a gastrectomy in an 18-month-old child, the indication being, as in my own case, severe gastrointestinal hemorrhage. The child survived and was in good condition at the end of a thirty-three month follow-up.

COMMENT

Peptic ulceration in infants and young children is most often associated with some other disease, which usually, as in my own case, is an upper respiratory infection. As a result, an ulcer is not usually considered among the diagnostic possibilities until some time has passed. Ulceration at this age is usually manifested by complications which, in order of frequency, are perforation, hemorrhage and stenosis. These complications account for a disproportionately large amount of emergency surgery in childhood.

Although the disease is relatively infrequent at this extreme of life, it must be considered, and considered urgently, when hemorrhage from the gastrointestinal tract is encountered in young children.

No general rules concerning surgical intervention exist. They would not be warranted. The decision to intervene must be made on the circumstances of the individual case and must be the joint responsibility of all concerned with the care of the child. Good pediatric care is imperative, as this case clearly demonstrates. Also implicit in the management of such a case are close, continuous observation, frequent professional conferences, and repeated laboratory studies.

It is not always wise to wait for a definite diagnosis of ulcer in the face of continued or recurrent hemorrhage. Infants tolerate blood loss poorly and may not respond to replacement therapy as well as this particular patient did. On the other hand, children tolerate surgery remarkably well, and, when the risk of continued bleeding is equated with the risk of surgical intervention, there is usually little doubt that a resort to operation is wiser.

The first step at operation is to determine the origin of the hemorrhage. In young children, bleeding from a peptic ulcer most frequently originates from a duodenal ulcer on the posterior wall, as in this case. The second step, if bleeding

is still active, is to control it by ligation of the causative vessel or vessels. Only then can the type of surgery required be decided upon. Gastrectomy is obviously a very radical measure, which, when it is possible, should not be performed in a young child. On the other hand, gastrojejunostomy alone results in a high incidence of marginal or stomal ulceration, while dissection of the ulcer is attended with technical difficulties in many cases, as it would have been in this one.

Generally speaking, conservatism is desirable in the surgery of peptic ulceration in young children, but it should be employed only when it is warranted by the conditions present. The final decision must be made on the basis of the extent and location of the pathologic process. In this case, as already pointed out, the location of the ulcer permitted no course other than gastrectomy, which was undertaken with the full realization that it was a calculated risk but the lesser of the evils which confronted us.

No attempt is made to draw conclusions from this single experience. It is striking, however, that in spite of the stormy postoperative course, caused by adrenal hypofunction, this child's progress in the two years since operation has been entirely satisfactory. He has demonstrated his ability to ingest and digest food in normal amounts, and careful observation, supplemented by laboratory studies, shows that he is developing at a rate consistent with his age. In the gastrectomy reported by Neilson and Black,[4] the child's growth after operation was almost the same as that of her twin sister. In this case, as in my own, there was no doubt of the ability of these very young children to compensate for the loss of a major portion of the stomach.

SUMMARY

A 2½-year-old boy with massive hemorrhage from a duodenal ulcer was treated by subtotal gastrectomy after failure of conservative measures. The postoperative course was complicated by the salt-losing syndrome due to adrenal hypofunction. In the two years which have elapsed since operation the patient's normal development and nutritional status have demonstrated the ability of a very young child to compensate for the loss of over half of the stomach.

The number of such cases in the literature is still very limited. Additional reports, with follow-up surveys, will aid in establishing the correct treatment for patients in this age group who require radical surgery.

Note.—Pediatric care in this case was provided by Dr. David Spizer and Dr. Richard Bagnetto, for whose cooperation I am grateful. They will report the laboratory and clinical aspects of the adrenal phase of this illness in detail elsewhere. Dr. Albert Segaloff assisted in the laboratory studies.

ADDENDUM

Since this article was written this patient passed away in Charity Hospital of New Orleans as a result of measles, interstitial pneumonia, and acute tracheo-bronchitis with ball-valve bronchial obstruction on February 18, 1957.

The pathological diagnosis included in addition to the above: Addison's disease with absence of the adrenal glands.

REFERENCES

1. Bird, C. E.; Limper, M. A., and Mayer, J. M.: Surgery in peptic ulceration of stomach and duodenum in infants and children. Ann. Surg. 114:526, 1941.

2. McAleese, J. J., and Seiber, W. K.: The surgical problem presented by peptic ulcer of the stomach and duodenum in infancy and childhood. Ann. Surg. 137:334, 1953.

3. Plummer, G. W., and Stabins, S. J.: Bleeding duodenal ulcer in infancy—a surgical problem. J. Pediat. 37: 899, 1950.

4. Neilson, J. R., and Black, J. H.: Massive bleeding from duodenal ulcer in infancy treated by gastrectomy. Pediatrics 15:433, 1955.

HYPOBARIC PONTOCAINE SPINAL ANESTHESIA FOR PATIENTS IN THE PRONE OR LATERAL POSITION

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Although there have been many reports in the anesthesia literature concerning the use of hypobaric pontocaine spinal anesthesia,[3-8] far too little use seems to be made of it today. It can be used with equal safety as hyperbaric spinal anesthesia if basic specific gravities and patient positions are kept in mind. Of particular value is its use for lumbar laminectomies,[3-5, 8] spinal fusions, pilonidal cystectomies, rectal surgery, and any orthopedic or general surgery of the back and extremities, when the patient is to be lying prone or with the operated side up, or in situations of surgery of one side or the other when the patient is unable to lie on the affected side for the administration of hyperbaric spinal anesthesia.

TECHNIQUE

The patient is premedicated with gr. ¾ to gr. 1½ nembutal or seconal one and a half hours before the anesthesia is to begin, and with 50 to 100 mgs. demerol and gr. 1/200 to 1/150 of atropine sulfate one hour prior to anesthesia. Scopolamine is generally avoided due to confusion that it produces in some patients.

The procedure used at the Confederate Memorial Medical Center follows that of pontocaine anesthesia generally advocated by Lund and Rumball,[4, 5] particularly in their use of adrenalin to prolong the action of the spinal anesthesia. For possibly prolonged surgery in the prone position it is desirable to use longer acting spinal anesthesia, since it is unwise to hazard administering a general anesthetic for supplementation to a patient in the prone position who is not intubated endotracheally; this is done by adding varying doses of 0.2 to 0.6 cc. of adrenalin 1:1000 to the pontocaine to insure two to four hours of anesthesia. In the exceptionally prolonged cases during lumbar laminectomies, if the spinal anesthetic does not last long enough, the surgeon can easily administer an additional spinal anesthetic through the dura in the exposed interspace where the surgery is being done.

The hypobaric spinal tray consists of a #22 spinal needle, a #20 spinal needle, two short #23 needles for the mixing of solutions, a 2 cc. and a 5 cc. syringe, files, a sponge stick and sponges, one ampule of procaine 1 per cent and ephedrine 2½ per cent, one ampule of 1 per cent pontocaine of 2 cc., one ampule of 10 cc. sterile distilled water, and one ampule of 1 cc. of 1:1000 adrenalin. These trays are prepared ahead of time and all units autoclaved at 250° F. at 25 lbs. pressure for thirty to forty-five minutes including all ampules. This eliminates the hazard of chemical contamination and has not noticeably significantly decreased the action of any of the drugs including the adrenalin, nor has it introduced any known morbidity to this time.

RECTAL SURGERY

Hypobaric spinal anesthesia is used for rectal surgery almost routinely at this hospital, since practically all rectal surgery is done in the Buie or prone jackknife position. If the positioning is to be in the lithotomy, then a hyperbaric saddle block anesthesia should be used. For the hypobaric spinal for rectal surgery in the Buie position, the patient is placed on his most convenient side and moderately flexed to facilitate lumbar puncture. The blood pressure is taken and recorded. The patient is then placed in 5° Trendelenberg and his back prepped with tincture of zephiran. The procaine 1 per cent and ephedrine 2½ per cent solution is aspirated in the 2 cc. syringe and a skin wheal raised at the L4-L5 interspace. If the patient's preoperative blood pressure is low (below 100 mm. hg. systolic) from conditions other than recent acute blood

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loss, 0.5 cc. of the procaine-ephedrine solution may now be given subcutaneously through the skin wheal superiorly so as not to obscure landmarks for the lumbar puncture. The spinal anesthetic solution may now be mixed and it is standard for all normal-sized patients, of 8 mgs. pontocaine (0.8 cc. of a 1 per cent pontocaine liquid solution) added to 2.2 cc. of sterile distilled water to make a total volume of 3 cc. If more than one and one-half to two hours anesthesia is desired, add 0.2 to 0.4 cc. of 1:1000 adrenalin to provide from two and a half to four hours anesthesia time. After the lumbar puncture has been completed, attach the syringe to the spinal needle stabilizing the needle firmly and after aspirating enough cerebrospinal fluid to be sure of a free flow (not over about 0.2 cc.,) inject the solution slowly (five to ten seconds). Immediately turn the patient over on his abdomen and jacknife the table, thus placing his head and legs inferior to his buttocks that remain superiorly. Prepping and draping may begin immediately and anesthesia will be complete in three to five minutes, most often from L4-L5 or S1 downward. No time is lost waiting for the pontocain solution to fix as should be allowed in hyperbaric saddle blocks before placing the patient in a prone and jackknife position, as the solution is floating upwards in the sacral segments all the while it is in the fixing process.

Since so few sympathetic nerves are blocked there is usually very little change in blood pressure, particularly if a small dose of ephedrine has been given two to three minutes before the spinal anesthetic was given. However, the blood pressure should be watched carefully as in any other spinal anesthetic, and it is a good idea to start an infusion of 500 cc. of 5 per cent glucose in distilled water. Any significant drops in the blood pressure may be easily corrected with small intravenous doses of 0.1 to 0.2 cc. vasoxyl. It is rare, and the result usually of too rapid an administration of the anesthetic solution, if a high spinal anesthetic occurs, but its only consequence should be hypotension (which can be easily corrected with intravenous doses of vasoxyl) and not serious respiratory depression, since in the main the upper thoracic or cervical segments that might be blocked would be the posterior nerve roots and even though sensory anesthesia may result motor function remains intact.

If the surgery outlasts the anesthesia in rectal cases, it is fairly easy to remove part of the drapes and do another lumbar tap while the patient remains in the Buie or jackknife position and repeat the injection of the anesthetic solution. By carefully judging the need for the addition of 1:1000 adrenalin solution, this should practically never occur as it is far easier and without increased morbidity to plan the spinal to last an hour longer than the contemplated surgery time. The advantages of this type of anesthesia are maximum relaxation and accomplishment of anesthesia without waiting for a hyperbaric spinal to fix; the procedure is quicker by far and probably safer than caudal anesthesia, and it obviates the need for endotracheal general anesthesia for rectal surgery.

LUMBAR LAMINECTOMIES AND SPINAL FUSION

Probably next in importance is the use of hypobaric spinal anesthesia for lumbar laminectomies and lumbosacral spinal fusions. This anesthesia should not be used if there is a total or near total block of cerebrospinal fluid anywhere in the subarachnoid space. It is easy, quick, and much less patient shock is seen during the surgery than with endotracheal general anesthesia. Ventilation of the patient is better, less bleeding is encountered, and the cautery may be used as surgically desired with complete freedom from explosive hazards. Local anesthesia with pentothal supplementation in the prone position without endotracheal intubation as a method of anesthesia is mentioned in passing only to be condemned, as a patient under these circumstances who develops airway obstruction from any cause is in a precarious position indeed even with

the most expert anesthesia management.

The patient is placed on the most convenient side and moderately flexed to facilitate lumbar puncture. The blood pressure is checked and recorded. The patient is then placed in 5-10° reverse Trendelenburg, his back prepped, and draped, and a skin wheal of 1 per cent procaine - 2.5 per cent ephedrine is raised at L2-L3 interspace. Depending on the patient's prespinal blood pressure, 0.5 to 1 cc. of the procaine - ephedrine solution is given deeply subcutaneously through the skin wheal superiorly. The spinal anesthetic is then mixed, varying somewhat with the patient's size and height, from 12-16 mgs. of pontocaine (1.2 to 1.6 cc. of 1 per cent pontocaine solution) adding from 0.2 to 0.6 cc. of 1:1000 adrenalin depending upon the anesthetic time desired (two and a half to five hours), and adding distilled water to bring it to a total volume of 6 cc. The lumbar puncture is then done with a #20 spinal needle at L2-L3, the syringe inserted and enough cerebrospinal fluid (0.2 cc.) aspirated to insure that a free flow has been accomplished. The anesthetic solution is then injected at a smooth rate taking ten to fifteen seconds for the total 6.2 cc. injection.

The patient is kept in the original position thirty seconds, then the table is leveled out of reverse Trendelenburg and the patient is turned to the prone with a chest roll supporting each shoulder. He remains in this position for another thirty seconds, then the table is slightly flexed and placed in 5-10° Trendelenburg. A quick sensory needle check at this time will usually show a beginning sensory change (not complete anesthesia) at the level of the scapula (T4 to T6). An infusion of glucose in distilled water should be started as soon as the patient is turned prone (or even before the spinal anesthetic is administered if the patient is particularly hypo or hypertensive or if otherwise considered to be a particularly poor risk), and the blood pressure followed closely. Prepping and draping may begin immediately, and at least twenty minutes should be allowed to pass before the basic positioning of the patient is changed, so as to allow for the fixation of pontocaine. Sensory changes will begin in a minute or two and anesthesia complete enough for surgery to begin in four to ten minutes. During the time that the patient is in mild Trendelenburg (at least the first twenty minutes) the patient's head should lie flat without a pillow.

Respiration should be watched carefully and if any signs of moderate to marked depression should develop (if this occurs at all, it should occur during the first twenty minutes because after this the pontocaine is fixed),[4] then appropriate measures of oxygen by mask, or even the extreme possibility of turning the patient to his side or back to administer positive pressure oxygen, may have to be instituted and surgery delayed temporarily until respirations have returned to a normal degree. These are precautions that should be carried out carefully, but respiratory depressions should not occur with good technique, (proper volume, rate of injection, positioning.) As Ruben and Kistler[9] so very aptly point out, one should be able to handle these complications with ease before using these procedures.

For additional patient comfort after the patient has stabilized after twenty minutes or so, small IV doses of demerol (25 mg.) may be given every thirty to forty-five minutes PRN to produce additional narcosis. This is superior to extra barbiturate sedation as the patient rests but is aroused easily and has more complete control over his airway. Pentothal should be avoided as with its use the dangers of general anesthesia would be ever present.

PILONIDAL CYSTECTOMIES

For pilonidal cystectomies the same procedure may be used as described above for lumbar laminectomies except that the initial reverse Trendelenburg is corrected to a normal level position. The lumbar tap is made at L3-L4 interspace with a #22 spinal needle, and a dose of pontocaine of 10 to 12 mg. mixed to a total volume of 4 cc. distilled water is administered in ten

to fifteen seconds. Rarely, if thought necessary, 0.2 cc. 1:1000 adrenalin is added to the anesthetic solution to insure two to three hours of anesthesia. The patient is then turned prone immediately after the anesthetic solution is injected and the table slightly flexed and placed in 5-10° Trendelenburg.

UNILATERAL ANESTHESIA

In situations of desired one-sided or near one-sided anesthesia, where the patient is unable to lie on his affected side and the upper or superior side is going to be the operative site (as in fractured femurs, hips, etc), the patient may be positioned for spinal anesthesia with the operative site up. The same technique is used as outlined above, and in most cases of hip, upper thigh, or leg surgery, the tap is done at L2-L3. An appropriate dose of ephedrine is either given or withheld, and the appropriate spinal anesthetic solution (10-14 mg. pontocaine mixed to a total volume of 4-5 cc. of distilled water, and 0.2 to 0.6 cc. 1:1000 adrenalin added if necessary to produce a sufficiently long anesthetic time) is mixed. Injection rate is ten to fifteen seconds and the patient remains on his side. After thirty seconds 5-10°Trendelenburg may be instituted to halt the cephalad movement of the anesthetic solution. Anesthesia will be most marked on the upper side and extremity. An infusion of 5 per cent glucose in distilled water is started intravenously and the blood pressure and respiration followed closely.

Although it can be easily done, I do not like to use this technique for kidney surgery in the lateral position, because most patients will feel lower side discomfort due to minimal anesthesia on the lower side and the extreme flexion that most urologists desire, the traction pain that is usually felt to varying degrees due to stimulation over unblocked autonomic pathways, and the difficulties encountered in cases that pneumothorax is induced, particularly unrecognized cases of small pneumothorax that may produce a tension pneumothorax.

IMMEDIATE COMPLICATIONS

In the past year this technique has been used by me for 17 lumbar laminectomies at this hospital, and I have used the technique prior to this time elsewhere on about 50 cases with one failure (incomplete anesthesia probably due to incomplete subarachnoid injection of the anesthetic). The patient was turned back in a supine position and endotracheal general anesthesia instituted and the surgery carried out. There have not been any cases of even moderate respiratory depression that needed to be treated with oxygen. Occasional hypotensives were easily managed with vasoxyl or neosynephrine drip solution (0.004 per cent), and fluids such as blood, etc. later on in the procedure for hypotension due to surgery and blood loss. In some of the earlier cases, the lumbar tap was done after the patient had been placed in the prone position, but this has been abandoned because it is a little more technically difficult and time consuming to do a good free-flowing tap and may carry added morbidity (more blood-tinged taps, more chance of trauma to a disc or nerve root).

Also during this time the technique has been used 60 times for rectal surgery, 3 times for pilonidal cystectomies, and 20 times for desired unilateral anesthesia when the operated side was to be superior in a laterally placed patient. It has been used approximately 500 times in other institutions prior to this time for rectal cases. In the rectal case, pilonidal cystectomy, and leg series, there have been no failures and no morbidity except possibly an increased need for postoperative urethral catheterization in the long-acting hemorrhoid series. Occasional hypotensives have been easily corrected and in a few cases higher spinal anesthesia has been observed. There has not been any case of severe to complete respiratory depression and not any morbidity directly or indirectly attributable to the anesthesia.

There has been one case of moderately severe respiratory depression from high spinal hypobaric anesthesia for a nephrec-

tomy that needed positive pressure oxygen. This depression lasted only about twenty minutes: the surgery continued, and there were no complications. There have been 3 cases of pneumothorax during nephrectomies that were difficult to handle (apprehension and pain, necessitating positive oxygen pressure and supplementation).

It is felt that fewer postspinal decompressive headaches occur with this technique than with regular hyperbaric spinal techniques, as there is less loss of spinal fluid through the needle hole in the dura since the needle hole remains in a less dependent position during surgery, and there is probably more complete sealing of it before the patient returns to a supine position.

SUMMARY

A brief outline has been presented describing the uses of long-acting hypobaric pontocaine spinal anesthesia, stressing its ease and simplicity of administration with discussion of its possible immediate complications with emphasis upon measures for their prophylaxis and treatment.

REFERENCES

1. Adriani, John: Techniques and Procedures of Anesthesia, Charles C Thomas, Springfield, Illinois, 1947.
2. Etherington-Wilson, W.: Specific gravity of the cerebrospinal fluid, Brit. M. J. 2: 165 (Aug. 7) 1943.
3. Lund, P. C., and Cameron, J. D.: Hypobaric pontocaine, A new technique in spinal anesthesia, Anesthesiology 6:565 (Nov.) 1945.
4. Lund, P. C., and Rumball, A. C.: Hypobaric pontocaine spinal anesthesia, 1640 consecutive cases, Anesthesiology 8:181 (March) 1947.
5. Lund, P. C., and Rumball, A. C.: Hypobaric pontocaine spinal anesthesia, for exploration of extruded nucleus pulposus, Treat. Serv. Bull. 2:20 (Aug.-Sept.) 1947.
6. Dye, Fred C., and Vaughan, James A.: Hypobaric saddle anesthesia for proctological surgery, Anesthesiology 10:489 (July) 1949.
7. Slater, H. M., and Stephen, C. R.: Hypobaric pontocaine spinal anesthesia in children, Anesthesiology 11:709 (Nov.) 1950.
8. Hunter, A. R.: Anesthesia for operations in the vertebral canal, Anesthesiology 11:367 (May) 1950.
9. Ruben, J. Eugene, and Kistler, Edwin M.: An evaluation of hypobaric pontocaine for spinal anesthesia with a report of 200 cases, Anesthesiology 10:621 (Sept.) 1940.
10. Snyder, J. J.: Hypobaric Spinal Anesthesia: A review of the literature and some clinical observations, Anesthesiology 12:301 (May) 1951.

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MATERNAL MORTALITY AT CHARITY HOSPITAL *

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There has been a marked reduction in maternal mortality at Charity Hospital in spite of spiraling admissions and an increasing concentrate of this state's obstetrical pathology. Complicated cases seem to gravitate to this institution from other hospitals and clinics for financial and other reasons. That many should have been treated in their own locality is obvious from the fact that 10 of the fatal cases listed in Table 1 arrived moribund.

The maternal mortality rate at Charity Hospital was investigated for the past eleven years (1946-1956, inclusive). This period covered 117,450 livebirths during which time 141 maternal deaths occurred giving an incidence of 12 deaths per 10,000 livebirths. There were no corrections or deletions. All were clinic patients and all were treated by one of the three obstetrical and gynecological services (Tulane, Louisiana State University, and Independent).

The statistics of the war years (1942-1945) are available for comparison in Table 1. Only totals of the Obstetrical Unit are included in this group (pregnancies twenty weeks or beyond). Hence only those gestations five months or more are considered in the upper portion of Table 1 that compares these periods; while the lower portion of this table includes all pregnancies regardless of their duration, hence the significant reduction is apparent.

Table 2 lists the causes and incidence of maternal mortality.

* Presented at the Seventy-seventh Annual Meeting of the Louisiana State Medical Society, May 8, 1957, New Orleans.

From the Division of Obstetrics and Gynecology, Tulane Unit, Charity Hospital of Louisiana at New Orleans.

TABLE 1
MATERNAL DEATHS PER YEAR

Year	Maternal Deaths Only pts. 20 wks. or more)	Live Births	Mat. Deaths/10,000 Live Births
WAR YEARS			
1942	20	5,350	37.58
1943	19	4,799	39.59
1944	17	4,304	39.50
1945	8	4,548	18.58
Total	64	19,001	33.68
PRESENT STUDY			
1946	14	7,007	19.97
1947	19	8,659	21.94
1948	15	9,407	15.94
1949	9	10,296	8.74
1950	18	10,696	16.82
1951	12	11,316	10.60
1952	16	11,312	14.19
1953	9	11,501	7.82
1954	13	12,093	19.08
1955	6	12,416	4.83
1956	10	12,747	7.84
Total	141	117,450	12.00

TABLE 2
MATERNAL MORTALITY 1946 - 1956

Total Live Births	117,450
Maternal Deaths per 10,000 Live Births	12.00

Causes of Death	No.	Deaths/10,000 Live Births
Toxemia	37	3.1
Infection	33	2.8
Hemorrhage	22	1.8
Embolism	14	1.1
Sickle Cell Disease	8	0.6
Lower Nephron Nephrosis	7	0.5
Sudden Death	4	0.34
Anesthesia	3	0.25
Neoplasm	3	0.25
Miscellaneous	9	0.76

TOXEMIA

The late toxemias of pregnancy are still the most important complication of pregnancy in our area as is evident from the data in Table 2. Our incidence at Charity Hospital averages approximately 17 per cent in spite of complete hospital and clinic facilities with adequate social and governmental assistance. The hiatus at present seems to be in the area of patient education. They must be taught the necessity of presenting themselves for clinic care, for of the 37 deaths in this series due to toxemia, 63.6 per cent did not attend clinic at all.

There were 23 eclamptics in this series and the remaining 14 are classified as "other toxemias". Significantly, 17 of the above 37 deaths occurred from cerebrovascular accidents and is the reason *sine qua non* for the three obstetrical services involved constantly casting about for better methods of controlling the characteristic vasospasm and tissue anoxia of this entity.[1-5, 12] That some measure of success has been accorded the efforts put forth is reflected in the overall reduction in the number of toxemic deaths as recorded in Table 3. This diminution of cerebrovascular accidents is probably at least partially due to the use of antihypertensive drugs.

INFECTION

Infection is still the second cause of deaths in this hospital regardless of effective antibiotics and chemotherapeutic agents. The reasons for its prominence are the large number of criminal septic abortions and the significant referral of infected cases from elsewhere. Table 4

TABLE 3
TOXEMIA DEATHS

	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956
Eclamptic Deaths per 10,000 L. B.	4.3	5.77	2.12	0.9	3.7	1.75	0.0	1.7	2.48	0.0	0.78
Other Tox. Deaths per 10,000 L. B.	4.3	1.15	1.06	0.0	0.0	1.75	2.6	1.7	1.65	0.0	0.00
Total Tox. Deaths per 10,000 L. B.	8.6	6.92	3.18	0.9	3.7	3.50	2.6	3.4	4.12	0.0	0.78
CVA Deaths in all Tox./10,000 L. B.	4.2	2.3	2.1	0.0	2.8	1.7	0.8	1.7	1.6	0.0	0.0

TABLE 4
FATAL INFECTIONS

Early septic abortions		15
Criminal interruption	10	
Denied criminal interruption	2	
Unknown	2	
Therapeutic abortion	1	
Suppurative thrombophlebitis		6
Pyelonephritis		3
Bronchopneumonia		2
Peritonitis		2
Tuberculosis		1
Boeck's sarcoidosis		1
Bulbar poliomyelitis		1
Infected abdominal pregnancy		1
Acute pseudomembranous enterocolitis		1
Total		33

gives the cause and incidence of fatal infections.

SEPTIC ABORTIONS

The frequency of criminal abortions is the single major factor that causes infection to maintain such a prominent position in maternal mortality tables of this vicinity. The relative ineffectiveness of antibiotics in these instances probably can be explained by at least two factors. First, there is usually dead placental tissue present with little or no blood supply that is an excellent pablum for bacteria and yet almost impossible to sterilize by blood-borne antibiotics. Second, due to the nature and cause of infection, these patients wait until they are acutely ill before presenting themselves for treatment, and consequently, have an overwhelming infection on admission.

Two patients in this group denied criminal interference although this was suspected, and two other charts failed to note whether or not this probability was present. The only therapeutic interruption listed in Table 5 was performed at another institution for severe renal infection at fourteen weeks. The patient subsequently developed postabortal sepsis originating in retained placental tissue and died from septic pulmonary infarcts in spite of massive antibiotic therapy.

SUPPURATIVE THROMBOPHLEBITIS

There are 6 definite cases in this group. All cases were treated promptly and by

TABLE 5
FATAL HEMORRHAGE

Ruptured uterus	6
Uterine atony (postpartal)	4
Placentae abruptio	4
Abdominal pregnancy	2
"Hemorrhagic diathesis" (Afibrogenemia)	2
Ruptured ectopic pregnancy	2
Placenta praevia	1
Placenta accreta	1
Total	22

accepted measures but all had septic pulmonary infarcts on admission and were extremely toxic. Indeed, 2 were in extremis on admission. In addition to antibiotics, pelvic vein ligation has been invaluable in limiting the number of deaths due to this entity as well as those listed under septic abortions, when done according to the proper criterion as set forth by Collins and collaborators.[10] Unfortunately, pelvic ligation was done as a last resort in these instances and not according to the above recommendations.

HEMORRHAGE

The third most important cause of death even in this era of liberal blood transfusions is hemorrhage and it is from this, apparently, that a large portion of preventable deaths occur. These preventable deaths were for the most part due to errors in judgment inherent in any large training institution regardless of adequate staffs and ready availability of whole blood. Table 5 records the causes and incidence of fatal hemorrhage in this series.

RUPTURED UTERUS

This is the commonest cause of fatal hemorrhage. No Pitocin was administered to any patient in this group, which was one of advanced age and parity as emphasized by other reports.[6]

UTERINE ATONY

Of the 4 deaths from uterine atony at least 3 were preventable. Here also advanced age and parity are the most important factors. These hemorrhages were sudden, unexpected, and uncontrollable despite oxytocics and emergency measures.

ABRUPTIO PLACENTAE

The 4 fatal cases in this group could well have been placed in the toxemia

series since in all the abruptio placentae was merely a complication of pre-eclampsia. Their deaths, however, were directly related to the placental separation and they received the added emphasis accorded the seriousness of these emergencies by being considered alone. Little could be done to help these 4 patients once they arrived.

ABDOMINAL PREGNANCY

There were 2 deaths due to hemorrhage secondary to abdominal pregnancies. The first was that of a primigravida in whom an accurate diagnosis was made at term and a laparotomy done. The fetus was obtained and the placenta left in situ. However, after operation was completed, bleeding from the placental site developed and a second laparotomy was done in an attempt to control the hemorrhage. Bleeding continued in spite of all measures with fatal results.

In the second patient the placenta was attached to the anterior abdominal wall below the umbilicus and the operator incised the placenta upon opening the abdomen. All measures used were to no avail and the patient was promptly exsanguinated. Neither of these is judged a preventable death.

"HEMORRHAGIC DIATHESIS"

Both these deaths occurred in 1950 before fibrinogen was available and without doubt they are classic cases of afibrinogenemia complicating pre-eclampsia, and premature placental separation.

EMBOLISM

There were 14 fatalities due to embolism. In this group are presented the statistics of the "bland" emboli of phlebothrombosis, the amniotic fluid emboli, and a single case of air embolism. Septic clots have previously been considered under thrombophlebitis. Preventability is especially difficult to judge in this group but there seemed to be several instances of definitely preventable factors.

PHLEBOTHROMBOSIS WITH EMBOLISM

Of the 9 cases in this group, 4 seemed to have preventable factors. All but 2 developed thromboses and emboli subsequent to surgical procedures. Most age groups are represented and parity is apparently of little importance.

AMNIOTIC FLUID EMBOLISM

Amniotic fluid embolism occurred four times, giving an incidence of 0.34 per 10,000 live births. All occurred during labor or immediately after delivery without warning.

It is interesting to note that the 3 spontaneous occurrences were in relatively older women of advanced parity, while the patient in whom the embolism seemed to be induced by the version was only 19 years old and a primigravida. It appears that manipulation and tumultous labor should be viewed with the possibility of this occurrence in mind.

AIR EMBOLISM

Air embolism occurred once in this series. It was secondary to a difficult manual removal of the placenta under inadequate anesthesia.

LOWER NEPHRON NEPHROSIS

Without doubt the frequent and liberal use of blood increases the hazard of this entity. In this series all patients but one had multiple transfusions with at least one reaction. Rh incompatibility was obvious in one instance on recheck, while, in the remainder, the cause of the incompatibility was less apparent.

The possibility of immunization to little known or undiscovered blood group factors is increasingly probable due to the frequency of transfusions. Two patients had abruptio placentae and in one, this was apparently the sole cause of the lower nephron nephrosis. All patients died in the anuric phase in spite of accepted therapy. The artificial kidney was used in one instance. Undoubtedly routine Coombs' tests in addition to the cross-match as advocated by Kellner [7] are indicated. At least 6 of these 7 deaths must be classified as preventable.

SICKLE CELL DISEASE

The 8 deaths due to sickle cell disease all occurred in sickle-cell crisis. It has been estimated that 1 out of 5 obstetrical patients with sickle-cell disease dies during pregnancy.[8] The susceptibility of these patients to infection and thromboses, their

poor tolerance of blood loss, and our incomplete knowledge of the mechanism of sickle-cell crises has also been illustrated elsewhere.[8]

SUDDEN DEATH

Into this category of sudden death fall the 4 patients who died suddenly and in whom no definite diagnosis could be proved because permission for autopsy was denied.

ANESTHESIA

Three deaths were due to general anesthesia. One died of aspiration of vomitus during ethylene ether induction. Another died while receiving cyclopropane and the last suffered a ruptured esophagus from intubation under anesthesia.

NEOPLASM

Three deaths were due to neoplasm: 1 lymphoma of the anterior mediastinum, 1 acute monocytic leukemia and 1 theca cell tumor.

MISCELLANEOUS

The rest are all single cases. The one patient who died of cardiac failure had tetralogy of Fallot with pre-eclampsia. Another congenital anomaly (renal hypoplasia) caused death from renal insufficiency at thirty-eight weeks. One individual died of acute porphyrinuria. The cases of arsenical poisoning and infectious hepatitis have been reported elsewhere.[9] There were two accidents: a patient who suffered burns of 50 per cent of her body surface at six months, and another who had a subdural hematoma from a fall in the postpartal period. The diabetic patient in this group was severe and sensitive to insulin. The last patient had asthma and was asphyxiated by a mucus plug during a severe attack.

COMMENT

The maternal death rate at this institution is showing a continuing reduction despite increasing admissions that tax the facilities of the obstetrical unit to their limit and in spite of the natural gravitation of much of this state's obstetrical pathology to this hospital. Errors in judgment that are inherent in any teaching institution are present in this series, especially in the deaths due to hemorrhage. Many factors seem to play major roles in the declining maternal death rate. Most important is a well trained staff sufficiently large to cope with the problems that arise. Patient education is also essential.

In addition, the striking decline of deaths due to toxemia is undoubtedly the result of a greater knowledge of the pathophysiology of this disease, allowing improved methods of antihypertensive therapy. Infection death rates have diminished due to effective chemotherapeutic and antibiotic agents in addition to pelvic vein ligation when indicated.[10, 11]

Ready availability of whole blood induced a reduction in the number of fatal hemorrhages. The advantage of liberal transfusions has, however, caused an increase in the frequency of lower nephron nephrosis which is most often due to transfusion reactions, apparently due, in turn, to blood group factors whose presence is not obvious on routine crossmatching and Rh typing. Hence the institution of the Coombs' test routinely, as advocated by Kellner, in addition to crossmatching and Rh typing, is mandatory especially in patients who have previously been transfused or in whom large and repeated administration of whole blood is being contemplated. In this manner only can incompatibilities due to little known or unknown blood group factors be made apparent.[7]

That the incidence of fatal embolism (except septic emboli) is unchanged is obvious. The largest number of emboli occur secondary to phlebothrombosis, and a further reduction in the incidence of bland emboli is possible only by meticulous observation in the postoperative period. Prophylactic anticoagulant therapy may be indicated in certain complicated obstetrical cases that require long periods of bed rest and apparently in those patients in whom evisceration has occurred.

Air embolism is preventable, and the possibility is always present during intrauterine manipulations, but it must be extremely infrequent. Fatal amniotic fluid embolism developed most frequently in pa-

tients of advanced obstetric age and parity, especially those in whom tumultuous labor was present. The only exception was the youthful primigravida in whom intrauterine manipulation allowed the fatal embolism to occur.

Sickle-cell disease is a grave complication of parturition, and experiences at this institution have been detailed elsewhere.[8] The remaining entities are a heterogeneous group of accidents and diseases that occurred during the period of this study and caused a maternal death. Their limited number permits no conclusions. That heart disease was relegated to this group merely reflects the low incidence of significant heart disease among the childbearing population in this area.

SUMMARY

1. An eleven year survey of maternal mortality at Charity Hospital during which time there were 117,450 live births is presented.

2. A marked and continuing reduction in the maternal death rate resulting in an incidence of 12.00 maternal deaths per 10,000 live births is recorded.

3. The lowest rate was recorded in 1955 when there were 4.83 maternal deaths per 10,000 live births. There were 12,416 live births during that year.

4. Major factors allowing this decrease were: (a) an adequate, well trained staff, (b) more advanced knowledge of toxemia of pregnancy, (c) effective chemotherapeutic and antibiotic agents, and (d) ready availability of whole blood.

5. Suggestions for decreasing the incidence of lower nephron nephrosis were presented.

6. The incidence of deaths due to embolism (except septic emboli) was unchanged, and suggestions for its reduction are presented.

7. A diverse miscellaneous group that is too small for analysis was presented in detail.

REFERENCES

1. Krupp, P. J., Farris, C., Peirce, C., and Jacobs, A: Am. J. Obst. & Gynec., 68:1118, 1954.
2. Krupp, P. J., Peirce, C., Farris, C., and Jacobs, A: Am. J. Obst. & Gynec., 71:247, 1956.
3. McCall, M. L.: Obst. & Gynec., 4:403, 1954.
4. McCall, M. L., Sass, D. K., Wagstaff, C., and Cutler, J.: Obstet. & Gynec., 6:297, 1955.
5. Collins, C. G., Nix, F. G., and Dyer, Isadore: Am. J. Obst. & Gynec., 66:1031, 1953.
6. Beacham, W. D., and Beacham, D. W.: Am. J. Obst. & Gynec., 61:824, 1951.
7. Kellner, Aaron: Obst. & Gynec., 5:299, 1955.
8. Beacham, W. D., and Beacham, D. W.: Am. J. Obst. & Gynec., 60:1217, 1950.
9. Mickal, Abe: Am. J. Obst. & Gynec., 62:409, 1951.
10. Collins, C. G., Smith, R. C., Burman, R. G. and Griffon, J. P.: Am. J. Obst. & Gynec., 64:488, 1952.
11. Collins, C. G., and others: Am. J. Obst. & Gynec., 58:1155, 1949.
12. Farris, C. and Krupp, P. J.: Am. J. Obst. & Gynec. 74:1043, 1957.

CONGENITAL "CLASPED THUMB" *

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Two cases resembling congenital "clasped thumb" were described by Miller,[1] in 1944, under the name of "Pollex Varus." One case was an eight weeks old infant and the other was a seventeen year old male orderly. In 1952, White[2] referred to 8 similar cases as "The Infant's Persistent Thumb Clutched Hand;" 5 were children and 3 were adults. In 1955, Weckesser[3] described 5 cases of congenital "Clasped Thumb;" 3 cases were infants and the other 2 were children, two and nine years of age, respectively.

ETIOLOGY

Etiology of this condition is acknowledged to be congenital agenesis or absence of the extensor pollicis brevis, which results in weak or absent active extension of the metacarpophalangeal joint. Also, the wrist assumes the attitude of ulnar deviation, for it should be remembered that the extensor pollicis brevis muscle is an important motor for radial deviation

* This paper was read before the annual meeting of the Louisiana Orthopaedic Association at Point Clear, Alabama, on December 7, 1957.

of the wrist as well as for extension of the metacarpophalangeal joint (Fig. 1).

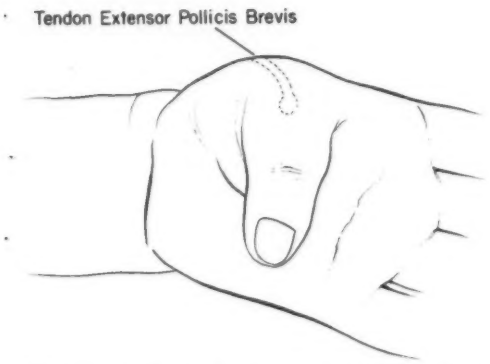

Figure 1. Defective metacarpophalangeal extension is caused by agenesis or absence of the extensor pollicis brevis.

CLINICAL FEATURES

Clinical features include greatest incidence of discovery in infants. The condition is easily overlooked until the baby starts to grasp objects, since normally the infant seldom opens the thumb during the first three or four months of life.[4] Occasionally a patient may tolerate the condition until adult life. Rarely is the mother certain of the exact date when the thumb becomes affected, and the presenting complaint is usually, "The baby does not open the thumb." Characteristic appearance of the deformity is: (1) flexion attitude of the thumb at the metacarpophalangeal joint, (2) thumb is turned in the palm, (3) ulnar deviation of the wrist, (4) hypermobility of the metacarpophalangeal joint (variable). We have seen 5 cases which fit the description of congenital "clasped thumb." All were discovered in infants under six months of age (Fig. 2). In 3 cases, deformity was limited to the thumbs; 2 of these were unilateral and 1 was bilateral. In the other 2 cases, in addition to bilateral thumb deformities, there were concurrent congenital deformities in the extremities, such as elbow or knee deformities, calcaneovalgus and talipes equinovarus.

DIAGNOSIS

Differential diagnosis includes poliomyelitis, peripheral nerve injury, congenital

Figure 2. There is no active metacarpophalangeal extension and the wrist assumes an attitude of ulnar deviation.

contracture or dislocation of the metacarpophalangeal joint, thumb of spastic paralysis, arthrogryposis, and stenosing tenosynovitis of the flexor pollicis longus tendon.[5] All of these conditions can be excluded by careful examination.

If diagnosis is made early in childhood, treatment by corrective casts is highly successful (Fig. 3). Cast immobilization is usually necessary for a period of three to seven months and casts are changed every few weeks to allow for growth of the extremity. If the condition is neglected until later years, correction by casts is unlikely, and tendon transplantation or metacarpophalangeal arthrodesis

Figure 3. When early diagnosis is made, corrective casts are usually successful.

is usually indicated. The tendon of the extensor digitorum communis is transferred into the base of the proximal phalanx of the thumb on its dorsum. This tendon is less specialized than the extensor indicis proprius, and extensor power of the index finger is not significantly al-

tered by its use. Metacarpophalangeal arthrodesis is the method of choice in adults with long standing deformity.

REFERENCES

1. Miller, James W.: Pollex varus. A report of two cases. University Hospital Bulletin 10:10, 1944.
2. White, J. Warren: The infant's persistent thumb-clutched hand, J. Bone & Joint Surg., 34-A: 680, 1952.
3. Weckesser, Elden C.: Congenital flexion-adduction deformity of the thumb (congenital "clasped thumb"), J. Bone & Joint Surg., 37-A: 977, 1955.
4. Gesell, Arnold: Infant and child in the culture of today, Harper & Bros. Pub., 101, 1943.
5. Loomis, Lyon K.: Flexion deformity of the infant thumb, So. Med. Jour., 50:1259, Oct. 1957.

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THE TECHNIQUE OF RADICAL LARYNGECTOMY IN CARCINOMA OF THE LARYNX * †

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Although this contribution is concerned only with the technique of total laryngectomy for carcinoma of the larynx, a few words must be said in explanation and justification of a policy which requires radical enucleative surgery of this kind. Both explanation and justification are simple. Carcinoma of the larynx is a lethal disease if its course is not interrupted. Unless the disease is seen in its early stages, only radical extirpation of the growth offers the patient any chance of survival. Furthermore, it must always be assumed that the tumor has extended histologically beyond the boundaries evident grossly, and apparently normal tissue must therefore be removed along with the tissue that is obviously diseased.

For these reasons, it has been our policy since 1950 to employ radical enucleative surgery in the primary treatment of patients with cancer of the larynx who are admitted to the Ear, Nose and Throat Service of the Tulane University School of Medicine at Charity Hospital of Louisiana at New Orleans. Any other policy would be self-defeating, for the majority of our patients, many of whom are Negroes, are seen only when the disease is far advanced.

Total laryngectomy is considered to be indicated when the growth has extended beyond one vocal cord, whether the extension is above or below the cord or across the midline or is of the infiltrative variety, in which the cord is fixed. Lesions extending beyond the larynx into the pharynx, piriform sinus or postcricoid area are treated by laryngectomy combined with en bloc neck dissection.

All our emphasis is upon surgery as the primary treatment of carcinoma involving the larynx. We utilize irradiation only in cases in which the patient refuses surgery or in which his disease is so extensive or his general condition so poor that the mere act of operation would be likely to be fatal.

The technique which we employ comprises removal of the larynx and the hyoid bone with the adjacent ribbon muscles en masse (Fig. 1). It may include excision of the base of the tongue, portions of the pharynx and esophagus, and the adjacent lobe of the thyroid if this seems necessary to encompass the disease. This technique is, in short, the wide-field type of laryngectomy, in contrast to the subperichondral or narrow-field excision.

Since 1950, we have performed surgery of this type on more than 80 patients with carcinoma of the larynx. There were no surgical deaths, as might be expected, in view of improved surgical methods, competent anesthesia, and control of infection by the antibiotics now available. Our morbidity has also been gratifyingly low. Eight of the 20 patients operated on five years ago or longer are known to be living and well at this time, and our observations suggest that with the contin-

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† From the Department of Otolaryngology of the Tulane University of Louisiana School of Medicine.

Figure 1. Resected larynx containing extensive malignant tumor involving the epiglottis. The hyoid bone, which is resected en masse with the larynx, is not shown in this view.

ued use of the radical procedure, we are likely to show a decided increase in the rate of survival as time passes. Schall's [1] 1953 report on 165 cases of carcinoma of the larynx in which radical surgery was performed between 1931 and 1948 showed 97 patients living and well for five years or longer and 3 deaths from other causes after the five-year period had passed. This is a remarkably hopeful record, especially in view of the fact that with proper voice training, 98 per cent of the surviving patients were completely rehabilitated.

To persuade the patient that he will be able to talk again is, in fact, the most important feature of our own preoperative regimen. A few days before the operation, he is introduced to a laryngectomized person who has mastered esophageal speech. He is thus made aware of the hopeful outlook on his own postoperative status and he becomes convinced that he too can learn to talk again. Practice in belching before the operation permits him to perform this act more promptly after surgery and thus expedites his training in esophageal speech.

TECHNIQUE

Laryngectomy is preferably performed under nitrous oxide anesthesia combined with sodium pentothal (thiopental sodium), after preliminary cocainization of the pharynx and larynx. The intratracheal technique is used. In cases in which growths are fungating and so large that they partially occlude the airway, the anesthesia tube is inserted directly into the trachea after a preliminary tracheotomy. The same technique is used in patients previously subjected to tracheotomy; the first step of the operation is to insert the tube through the existing incision.

The approach to the lesion is through a vertical midline incision through the skin and subcutaneous tissue. The incision is begun 2 cm. above the hyoid bone and extends downward over the eminence of the thyroid cartilage to the suprasternal notch, from which a ring of skin and subcutaneous tissue is removed, for later placement of the tracheal stoma. This incision provides adequate exposure for removal of the larynx, hyoid bone, the upper portion of the trachea, and such adjacent structures as may require removal. It is easily modified to encircle a previous tracheotomy incision.

The skin flaps are reflected laterally in the fascial plane just over the sternohyoid and omohyoid muscles, thus exposing the anterior surface of the larynx and hyoid bone with their attached muscles. The sternohyoid and omohyoid muscles, which lie most superficially, are transected at their insertion into the hyoid bone and are then reflected. If they are grossly free of disease, they are preserved to facilitate closure of the wound. They can, however, be sacrificed with impunity.

Mobilization of the larynx and hyoid bone begins with separation of the suprahyoid muscles and tendons from the hyoid bone; this technique permits the en masse removal of these structures and also per-

mits a wider margin of excision around the epiglottis.

The sternothyroid and thyrohyoid muscles, which cover the anterior surface of the larynx, are allowed to remain in situ and are removed with the larynx and hyoid bone. The sternothyroid muscle is sectioned on each side close to its origin, to expose the lobes of the thyroid.

The thyroid gland is divided in the midline between hemostats, and hemostasis is secured by a running suture on each wound edge. The superior portion of each lobe is reflected from the cricoid cartilage and the inferior surface of the larynx. If this line of dissection seems to run too close to the diseased portion of the larynx, the adjacent lobe of the thyroid is resected with the larynx and other structures, or, if necessary, both lobes are removed.

The inferior constrictor muscle is cut bilaterally by sharp dissection as it crosses the lateral border of the thyroid cartilage. This incision is carried up to include the superior cornu of the larynx.

The superior laryngeal vessels, which run between the cornu of the larynx and the hyoid bone and pierce the thyrohyoid membrane, are clamped, cut and ligated. With this step, the larynx and hyoid bone are now completely mobilized except for the attachments to the trachea below, the base of the tongue above, and the upper esophagus and pharynx underneath.

At this stage of the procedure the trachea is opened and the anesthesia tube placed at the beginning of the operation is removed and is reposited in the trachea. It must fit snugly within the trachea, to provide water-tight closure for the administration of the anesthetic during the removal of the larynx. It is anchored to the lower edge of the tracheal incision by a safety pin or suture.

The trachea is ordinarily opened between the second and third rings, but it can be sectioned at any level between the first and fourth rings. The incision is slanted upward and posteriorly. A lip of mucosa is removed from the posterior tracheal wall if there is a margin of normal tissue measuring at least 2 cm. between the cut edge of the trachea and the boundary of the tumor. Otherwise, this step is omitted.

The larynx is opened above the hyoid bone, on the side opposite to the lesion and lateral to the epiglottis. With the attached hyoid bone it is separated from the base of the tongue, the trachea, and the upper esophagus and pharynx (Fig. 2). The incision employed provides full

Figure 2. Surgical field just before section of pharynx and larynx and en masse removal of larynx and hyoid bone.

visualization of the laryngeal tumor during its removal and also permits removal of a wide margin of normal tissue along with the resected structures; as a rule, at least 1.5 cm. of normal tissue is left between the margin of the tumor and the line of excision. As much of the pharynx and esophagus as is necessary is removed to suit the exigencies of the individual case.

Careful hemostasis is accomplished after the larynx and attached structures are removed. Then a feeding tube (Levin type) is inserted before closure of the pharynx is begun. The base of the tongue and the anterior pharyngeal mucosa are united by a transverse line of sutures. This technique helps to prevent stricture and aids in the development of esophageal speech since it preserves a good upper esophagus and pharyngeal pouch.

The pharyngeal closure is re-enforced with an overlap from the sternohyoid and omohyoid muscles, all dead space thus being obliterated. The skin and subcutane-

ous tissues are approximated with vertical mattress sutures. Prevention of infection by antibiotics has made it possible to eliminate all drainage, in the usual case, except a small nylon drain in the wound.

The tracheal stoma is sutured to the skin of the suprasternal notch by accurately placed sutures of #0000 silk. Retention sutures in the trachea are not regarded as necessary. After a large tracheal tube has been inserted, a fairly large pressure dressing is applied.

POSTOPERATIVE MANAGEMENT

The postoperative routine follows the principles of management of any major procedure on the neck. Hospitalization is seldom necessary beyond a week. At this time the sutures are removed, as is the feeding tube, and the patient is discharged. He takes soft diet for a week, then resumes his usual full diet. The tracheal tube is worn from one to two months.

Three weeks after operation the patient is referred to the speech clinic at the Tulane University School of Medicine, to learn esophageal speech. Competent speech therapists can teach a cooperative patient to talk by this route within four to six weeks.

At the end of three or four weeks the patient has fully regained his health and strength (Fig. 3). At the end of four to six weeks he is completely rehabilitated. He can therefore return to his usual occupations with the assurance that the radical surgery which he has undergone will not interfere with his normal way of life and has given him every possible chance of being cured of his malignant tumor.

Figure 3. A. Preoperative view of carcinoma of larynx.

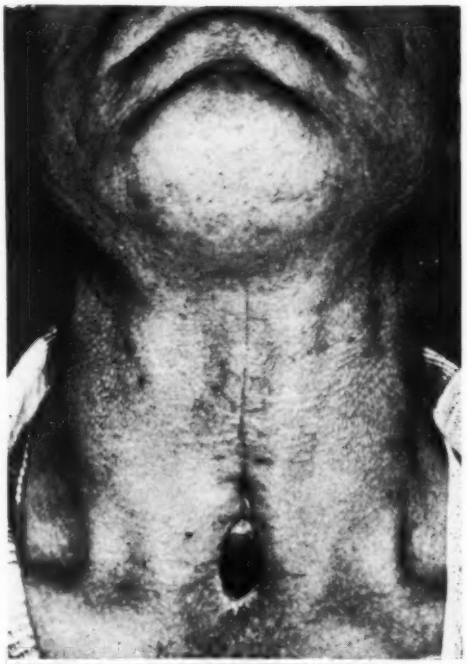

Figure 3. B. Postoperative view. This picture was taken four weeks after operation. The tracheal tube had already been discarded.

SUMMARY

Carcinoma of the larynx is a lethal disease. It is frequently observed in such an advanced stage that only radical extirpative surgery offers the patient any prospect of survival. This policy has been followed on the Tulane University School of Medicine service in Charity Hospital of Louisiana at New Orleans for the last seven years.

The technique employed is described. It has been used in more than 80 cases, with no surgical deaths and with gratifyingly low morbidity. Esophageal speech is readily taught after operation, and the patient returns to his former occupation in four to six weeks.

REFERENCE

1. Schall, LeRoy A.: Evaluation of total laryngectomy, Tr. Am. Acad. Ophth., 58:26, 1954.

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DANGERS OF THE FORAND "AFL-CIO" BILL HR 9467

The issue and dangers of State Socialism as introduced by compulsory sickness insurance and medical care plans are again before the people of this nation. An amendment to the Social Security Act has been introduced by Representative Aime Forand of Rhode Island. Under this bill it is proposed that all persons over 65, who are eligible to receive Social Security benefits (whether or not they are receiving them) will be eligible for sixty days of hospitalization in any twelve-month period.

This in actuality is a socialized medicine proposal and is essentially the same as those of 1941-1951, and a succession of bills spoken of as the Wagner-Murray-Dingell bills which called for "National Compulsory Health Insurance." The difference is that the present proposal applies to a smaller segment of the population at this time. The beneficiaries would be the approximately twelve to thirteen million persons on the Social Security rolls eligible to receive Old Age and Survivors benefits. If enacted, the age limits would be progressively extended by anticipated legislation, such that within a few years the entire "National Compulsory Health Insurance" scheme would rapidly come into operation.

The American Medical Association has repeatedly opposed compulsory health insurance and is unequivocally opposed to this new version. Opposition to this precipitate and revolutionary proposal is great. Along with the AMA are the American Farm Bureau Federation, the National Retailers Federation, the U. S. Chamber of Commerce, life and health insurance industries, the National Association of Manufacturers, and various other organizations who are interested in arresting the march of socialism. The American Hospital Association, on December 1, announced that "it believes that the Forand Bill (HR 9467) is not a suitable solution to the problem of financing the hospital needs of the aged." In summarizing its objections to the Forand Bill, the statement of the AHA continued:

1. "Eligibility of aged beneficiaries is based on attainment of prescribed ages without regard to their employment status and thus invites a progressive reduction of these age levels with the ultimate possibility of a total program of government financed hospital care."

2. "The bill makes possible the provision of care for other than health reasons."

3. "The bill provides inadequate safeguards against governmental interference with the actual operation of hospitals.

Such interference would most likely hamper evolution of patterns of hospital service to the detriment of patient care."

The Association also said that it believes "that every realistic effort should first be made to meet these needs promptly through other mechanisms utilizing existing systems of voluntary prepayment." If this approach does not appear workable within the immediate future, "the use of social security to provide the mechanism to assist in the solution of the problems of financing hospital needs of the retired aged may be necessary ultimately."

Besides the objection that this bill is creeping socialism, other arguments against this plan exist which should prevent its adoption. The number of persons over 65 is actually about 9 per cent of the total population. Of these, it is estimated that one-third are medically indigent and should be eligible for assistance on a local basis. This permits a more effective determination of the proper distribution of such assistance. At present, the medical profession and the hospitals are providing adequate service.

The coverage provided by voluntary prepayment sickness insurance is spreading year by year. There has been 155 per cent increase in ten years, and 66.3 million are now covered by these policies. Forty per cent of the people who entered hospitals last year had insurance company policies to help pay the cost. It would seem to be most undesirable to discourage people from providing for their own future care. It is obvious that the voluntary approach to the problem of medical care is working and is responsible for the achievements in the field of health. In due time it will be adequate to solve the problem of hospitalization for the aged. The voluntary approach should not be abandoned now.

It is recognized that labor unions exert pressure for the government to take over with a National Health Insurance scheme. As recently as September 26, Walter Reuther stated: "I think it can be said fairly that while medical societies may have entered prepayment reluctantly in order to avert government medicine, labor entered voluntary health insurance reluctantly because a government program was not available." The implications of this statement of a union leader should be considered along with the statement of President David B. Allman of the AMA: Labor union demands "are so great as to make voluntary health insurance economically unsound. Thus, voluntary insurance would be made to appear undesirable or unequal to the task, and the idea of complete government control of all health insurance would thereby be fostered."

It should be obvious that if this legislation represented in the Forand bill is enacted the general principle that the federal government has the right to control that which it subsidizes will be maintained with legislative and judicial action produced under labor pressure. In such a situation hospitals that participate in any part of this subsidy will lose their autonomy and their effectiveness as community instruments. They will become a part of a massive bureaucracy and evolve as cathedrals of perfunctory medical care.

The proposal to make the Forand Bill palatable to certain groups in the health field, such as the AHA and the Blue Cross, which provide the administration of the benefits through the nonprofit organization, such as the Blue Cross, is in no sense a protection against bureaucratic dominance. If such a scheme were in operation its direction would be swept by further legislative action into the bureaucratic control.

Successive efforts to enact the legislation supporting state medicine by increments have been opposed by organized medicine consistently. The Forand Bill is another effort to establish state medicine. It should be opposed by every physician and every citizen who abhors creeping socialism.

ORGANIZATION SECTION

The Executive Committee dedicates this section to the members of the Louisiana State Medical Society, feeling that a proper discussion of salient issues will contribute to the understanding and fortification of our Society.

An informed profession should be a wise one.

REPORT ON ACTIONS OF THE HOUSE OF DELEGATES AMERICAN MEDICAL ASSOCIATION ELEVENTH CLINICAL MEETING

Dec. 3-6, 1957 — Philadelphia

This report covers only a few of the many important subjects dealt with by the House and is not intended as a detailed report on all actions taken.

Fluoridation of public water supplies, free choice of physician, the Heller Report on organization of the American Medical Association, the Forand Bill providing hospital and surgical benefits for Social Security beneficiaries, guides for occupational health programs covering hospital employees, distribution of Asian influenza vaccine and guides for the medical rating of physical impairment were among the variety of subjects acted upon by the House of Delegates at the American Medical Association's Eleventh Clinical Meeting held Dec. 3-6 in Philadelphia.

Dr. Cecil W. Clark of Cameron, Louisiana, was named 1957 General Practitioner of the Year after his selection by a special committee of the Board of Trustees for outstanding community service. Dr. Clark, 33-year-old country doctor who was a medical hero during Hurricane Audrey last June, was present at the meeting to receive the gold medal which goes with the annual award.

Speaking at the opening session on Tuesday, Dr. David B. Allman of Atlantic City, A.M.A. President, called for "more freedom, not less, in America and in the medical profession." Dr. Allman urged delegates to embark on local action campaigns to enlist full community support in opposition to the Forand Bill, a pending Congressional proposal which would provide hospital and surgical benefits for persons who are receiving or are eligible for Social Security retirement and survivorship payments. The Forand Bill, he said, is "cut from the same cloth" as national compulsory health insurance and "emanates from the same minds."

Total registration at the end of the third day of the meeting, with half a day still to go, had reached 5,375, including 2,562 physician members.

Fluoridation of Water

In settling the most controversial issue at the Philadelphia meeting, the House of Delegates approved a joint report of the Council on Drugs and the Council on Foods and Nutrition which endorsed the fluoridation of public water supplies as a safe and practical method of reducing the incidence of dental caries during childhood. The 27-page report on the study which was directed by the House at the Seattle Clinical Meeting one year ago contained these conclusions:

"1. Fluoridation of public water supplies so as to provide the approximate equivalent of 1 ppm of fluorine in drinking water has been established as a method for reducing dental caries in children up to 10 years of age. In localities with warm climates, or where for other reasons the ingestion of water or other sources of considerable fluorine content is high, a lower concentration of fluoride is advisable. On the basis of the available evidence, it appears that this method decreases the incidence of caries during childhood. The evidence from Colorado Springs indicates as well a reduction in the rate of dental caries up to at least 44 years of age.

"2. No evidence has been found since the 1951 statement by the Councils to prove that continuous ingestion of water containing the equivalent of approximately 1 ppm of fluorine for long periods by large segments of the population is harmful to the general health. Mottling of the tooth enamel (dental fluorosis) associated with this level of fluoridation is minimal. The importance of this mottling is outweighed by the caries-inhibiting effect of the fluoride.

"3. Fluoridation of public water supplies should be regarded as a prophylactic measure for reducing tooth decay at the community level and is applicable where the water supply contains less than the equivalent of 1 ppm of fluorine."

Free Choice of Physician

Acting on the issue of free choice in relation to contract practice, the House passed a resolution which reaffirmed approval of previous interpretations of the Principles of Medical Ethics by the Association's Judicial Council and directed that they be called to the attention of all constituent associations and component societies. One Council opinion, issued in 1927 and reaffirmed in Philadelphia, stated that the contract practice of medicine would be determined to be unethical if "a reasonable degree of free choice of physician is denied those cared for in a community where other competent physicians are readily available." The resolution also cited a Council opinion, published in the October 19, 1957, issue of The Journal of the A.M.A., which stated that the basic ethical concepts in both the 1955 and 1957 editions of the Principles of Medical Ethics are identical in spite of changes in format and wording. This opinion added that "no opinion or re-

port of the Council interpreting these basic principles which were in effect at the time of the revision has been rescinded by the adoption of the 1957 principles."

The 1927 Council report also pointed out that "there are many conditions under which contract practice is not only legitimate and ethical, but in fact the only way in which competent medical service can be provided." Judgement of whether or not a contract is ethical, the report said, must be based on the form and terms of the contract as well as the circumstances under which it is made.

In another action related to the issue of free choice, the House adopted a resolution condemning the current attitude and method of operation of the United Mine Workers of America Welfare and Retirement Fund "as tending to lower the quality and availability of medical and hospital care to its beneficiaries." The resolution also called for a broad educational program to inform the general public, including the beneficiaries of the Fund, concerning the benefits to be derived from preservation of the American right to freedom of choice of physicians and hospitals as well as observance of the "Guides to Relationships Between State and County Medical Societies and the UMWA Welfare and Retirement Fund" which were adopted by the House last June.

The Heller Report

Acting on the report of the Committee to Study the Heller Report on Organization of the American Medical Association, the House reached the following decisions on ten specific recommendations:

1. The office of Vice-President will be continued as an elective office.

2. The offices of Secretary and Treasurer will be combined into one office to be known as Secretary-Treasurer, and that officer will be selected by the Board of Trustees from one of its number.

3. The duties of the Secretary-Treasurer will be separated from those of the Executive Vice-President.

4. The office of General Manager will be discontinued, and the new office of Executive Vice-President will be established. The latter, appointed by the Board of Trustees, will be the chief staff executive of the Association.

5. The Council on Medical Education and Hospitals and the Council on Medical Service will continue as standing committees of the House of Delegates, but their administrative direction will be vested in the Executive Vice-President.

6. The voting members of the Board of Trustees will be limited to eleven—the nine elected Trustees, the President and the President-Elect. The Vice-President and the Speaker and Vice-Speaker of the House of Delegates will attend all Board meetings, including executive sessions, with the right of discussion but without the right to vote.

7. The House disapproved of the proposal to elect the Trustees from each of nine physician-population regions.

8. The office of Assistant Secretary will be discontinued, and a new office of Assistant Executive Vice-President will be established.

9. The Committee on Federal Medical Services will be retained as a committee of the Council on Medical Service and will not become a part of the Council on National Defense.

10. The Speaker of the House will appoint a joint and continuing committee of six members, three from the Board of Trustees and three from the House, to redefine the central concept of A.M.A. objectives and basic programs, consider the placing of greater emphasis on scientific activities, take the lead in creating more cohesion among national medical societies and study socio-economic problems.

The accepted recommendations were referred to the Council on Constitution and By-laws with a request to draft appropriate amendments for consideration by the House at the 1958 annual meeting in San Francisco.

The Forand Bill

The House condemned the Forand Bill as undesirable legislation, approved the firm position taken in opposition to it and expressed satisfaction that the Board of Trustees has appointed a special task force which is taking action to defeat the bill. In a related action, giving strong approval to Dr. Allman's address at the opening session, the House adopted a statement which said:

"It is particularly timely that our President has so forcefully sounded the clarion call to the entire profession for emergency action. With complete unity, definition and singleness of purpose, closing of ranks with all age groups and elements of our organization we must at this time stand and be counted. Thus we can exert the physician's influence in every possible direction against invasion of our basic American liberties in the form of proposed legislation alleged to compulsorily insure one segment of the population against health hazards at the expense of all."

Health Programs for Hospital Employees

A set of "Guiding Principles for an Occupational Health Program in a Hospital Employee Group" was approved by the House. The guides were developed by a joint committee of the American Medical Association and the American Hospital Association and already had been formally approved by the A.H.A. They include these statements:

"Employees in hospitals are entitled to the same benefits in health maintenance and protection as are industrial employees. Therefore, programs of health services in hospitals should use the tech-

niques of preventive medicine which have been found by experience in industry to approach constructively the health requirements of employees.

"It is essential that employee health programs in hospitals, as in industry, be established as separate functions with independent facilities and personnel. The fact that hospitals are engaged in the care of the sick as their primary function does not alter the necessary organizational plan for an effective occupational health program."

Asian Influenza Vaccine

The House considered three resolutions dealing with the Asian influenza immunization program and then adopted a substitute resolution calling attention to "certain inadequacies and confusions in the distribution of vaccines" and directed the Board of Trustees to seek conferences through existing committees "with a view to establishing a code of practices regulating the future distribution of important therapeutic products, so that the best interest of all the people may be served." The resolution pointed out that the American Medical Association already has a joint committee with the American Pharmaceutical Association and the National Association of Retail Druggists, in addition to a liaison committee with the Drug Manufacturers Association.

Medical Rating of Physical Impairment

The House accepted a 115-page "Guide to the Evaluation of Permanent Impairment of the Extremities and Back" which was developed by the Committee on Medical Rating of Physical Impairment as the first in a projected series of guides. The delegates commended the committee for doing "a superb job on this difficult subject" and expressed pleasure that the guides will be published in The Journal of the A.M.A. The guides are expected to be of particular help to physicians in determining impairment under the new disability benefits program of the Social Security Act.

Miscellaneous Actions

Among a wide variety of other actions, the House also:

Directed that a new committee be established in the Council on Industrial Health to study **neurological disorders in industry;**

Noted with approval the establishment of the American Medical Research Foundation, which will initiate and encourage necessary **medical research** and correlate and disseminate the results of studies already under way;

Decided that informational materials which are sent to A.M.A. delegates should also be sent to all **alternate delegates;**

Affirmed that it is within the limits of ethical propriety for physicians to join together as partnerships, associations or other **lawful groups** provided that the ownership and management of the affairs thereof remain in the hands of licensed physicians;

Instructed that the appropriate committee or council should engage in conferences with **third parties** to develop general principles and policies which may be applied to the relationship between third parties and members of the medical profession;

Urged state medical society committees on aging and insurance to make continuing studies of **pre-retirement financing of health insurance** for retired persons;

Endorsed a suggestion that the Committee on Federal Medical Services sponsor a national conference on **veterans' medical care** during 1958;

Asked the Board of Trustees to study the feasibility of having the Association finance a thorough investigation of the **Social Security** system by a qualified private agency;

Suggested that physicians and their friends make a vigorous effort to obtain Congressional enactment of the **Jenkins-Keogh Bill;**

Approved the "Suggested Guides to Relationships Between Medical Societies and **Voluntary Health Agencies**";

Strongly recommended that a completely adequate and competent medical department be established in the **Civil Aeronautics Administration** directly responsible to the CAA Administrator, and

Congratulated the General Electric Company for its medical television presentations on the subject of **quackery.**

Opening Session

At the Tuesday opening session Rear Admiral B. W. Hogan, Surgeon General of the U. S. Navy, presented the Navy Meritorious Public Service Citation to Dr. Dwight H. Murray of Napa, Calif., immediate past president of the Association. Contributions to the American Medical Education Foundation, for financial aid to the nation's medical schools, were presented by four state medical societies: California, $143,043.25; Utah $10,390; New Jersey, $10,000, and Arizona, $8,040. The Interstate Post Graduate Medical Association of North America gave $1,000, and the Illinois State Medical Society announced that it was adding $10,000 to the $170,450 presented at the New York meeting last June.

MEDICAL NEWS SECTION

CALENDAR

PARISH AND DISTRICT MEDICAL SOCIETY MEETINGS

Society	Date	Place
Calcasieu	Fourth Tuesday every other month	Lake Charles
East Baton Rouge	Second Tuesday of every month	Baton Rouge
Morehouse	Third Tuesday of every month	Bastrop
Natchitoches	Second Tuesday of every month	
Orleans	Second Monday of every month	New Orleans
Ouachita	First Thursday of every month	Monroe
Rapides	First Monday of every month	Alexandria
Sabine	First Wednesday of every month	
Tangipahoa	Second and fourth Thursdays of every month	Indepencence
Second District	Third Thursday of every month	
Shreveport	First Tuesday of every month	Shreveport
Vernon	First Thursday of every month	

SEMINAR ON RHEUMATIC DISEASES

Under the auspices of the Louisiana Chapter of the Arthritis and Rheumatism Foundation, Members of the faculty of Louisiana State University School of Medicine and Tulane University School of Medicine will present a one-day seminar on diagnosis and treatment of the rheumatic diseases. There will be no registration fee.

The seminar will be held in Hutchinson Auditorium, 1430 Tulane Avenue, on Saturday, February 1, 1958, beginning at 9:00 A.M. Dr. Russell L. Cecil, Medical Director of the National Arthritis and Rheumatism Foundation, will be guest speaker. Participants in the course will be Drs. W. R. Akenhead, Irvin Cahen, M. R. Jeffrey, Maridel Saunders, W. H. Schindel, T. E. Weiss and Guy T. Williams. The medical public will be welcome.

AMERICAN PHYSICIANS' ART ASSOCIATION

The American Physicians' Art Association was organized in 1936 at San Francisco during the annual meeting of the American Medical Association in that city. The first exhibit was held that year, and consisted of the art works of a number of San Francisco physicians. Annual art exhibits are held at the meeting of the American Medical Association, and the organization has steadily grown to a membership of over 450 physicians.

Physicians with hobby interests in painting, photography, sculpture, or wood carving are encouraged to participate in the activities of the American Physicians' Art Association. If you desire further information about this group, please communicate with Dr. C. Grenes Cole, Secretary-Treasurer, Louisiana State Medical Society. We hope to hold local exhibits, one of the first of which will be at the annual meeting of the Louisiana State Medical Society, which precedes the exhibit at the annual meeting of the American Medical Association by about one month. Art pieces submitted at the local exhibit may also be mailed to the exhibit at the annual meeting of the American Medical Association. Regular membership dues include the fees for hanging two art pieces at the national exhibit.

SOUTHERN MEDICAL ASSOCIATION

The largest meeting in 51 years of the history of the Southern Medical Association was held in Miami Beach, November 11-14.

The unofficial registration total was 5,761 of which 3,133 were physicians.

At the conclusion of the meeting Dr. W. Kelly West of Oklahoma City, Oklahoma, was installed as President succeeding Dr. J. P. Culpepper, Jr., Hattiesburg, Mississippi. Other officers elected at this meeting were:

President-Elect, Dr. Milford O. Rouse, Dallas, Texas

First Vice-President, Dr. Edwin H. Lawson, New Orleans, La.

Second Vice-President, Dr. Donald F. Marion, Miami, Florida

Elections by the Council included Council Chairman, Dr. Fount Richardson, Fayettville, Arkansas; Council Vice-Chairman, Dr. Harry Lee Claud, Washington, D. C.; Member of Board of Trustees, Dr. J. P. Culpepper, Jr., Hattiesburg, Mississippi.

Recipient of the Association's Research Medal was Dr. Joseph M. Hill of Dallas, Texas. Dr. Hill is the sixteenth winner of this outstanding award for scientific research which was established in 1912.

Dr. Kenneth M. Lynch, President and Dean of the Faculty of the Medical College of South Carolina, received the Association's Distinguished Service Award.

The future schedule of meetings is as follows:

1958—New Orleans, Louisiana, November 3-6

1959—Atlanta, Georgia, November 9-12

1960—Baltimore, Maryland, November 14-17
1961—Dallas, Texas, November 13-16
1962—Miami Beach, Florida

PREVIEW OF THE 1958 MLA MEETING

The Fifty-seventh annual meeting of the Medical Library Association will be held in Rochester, Minnesota from June 2 through June 6, 1958, with headquarters at the Hotel Kahler. The theme of the Rochester meeting will be "Advances in Medical Library Practice". Mr. Thomas E. Keys, Librarian of the Mayo Clinic, is Convention Chairman and letters of inquiry should be addressed to him.

A pre-convention activity is being planned for Saturday, May 31. A series of refresher courses embracing many fields of medical library work will be given. Classes will be made up from the following subjects: Administration, Acquisitions, Classification, Cataloging, Non-book materials, Photoduplication, Public Relations, Reference Work, Rare Books, History of Medicine, Bibliographic Services, Periodicals, Binding, Library Architecture, Equipment, and Medical Terminology.

It will be possible for each participant to take four courses during the day, two in the morning and two in the afternoon. Each session will be 1½ hours in length, the hour for a prepared lecture and a half hour for a discussion period.

Among the highlights of the regular program will be a panel discussion on what the medical specialists expect from the Medical Library. Speakers will be from the Mayo Clinic Staff. A one day trip is being planned to Minneapolis and St. Paul with visits to the University of Minnesota, The James J. Hill Reference Library and the Ramsey County Medical Library.

After a day in the Twin Cities the remainder of the program will be held in Rochester. There will be a Symposium on The Medical Center Library, and a session on American Medical History and Medical Librarianship.

Arrangements are being made for pre and post convention tours for those who may wish to explore some of the natural beauty of Minnesota. All medical librarians are cordially invited to attend.

MEDICAL RESEARCH FOUNDATION ESTABLISHED FOR TAY-SACH'S DISEASE AND ALLIED DISORDERS

A new non-profit foundation has been established to support and stimulate research, clinical, and educational programs in Tay-Sachs' disease and allied heredo-familial, neuro-degenerative diseases of infancy and childhood. The scope of the program will include, in addition to Tay-Sachs' disease, Niemann-Pick's disease, Infantile Gaucher's disease, Schilder's disease, Diffuse Sclerosis, Amyotonia Congenita, Friedreich's ataxia, and others. The foundation is known as National Tay-Sachs Association, Inc., New York Chapter, and is composed of parents who have afflicted children, interested laymen, and medical personnel in the field.

The foundation is cooperating with the existing clinical and research program on Tay Sachs' disease and certain of these allied diseases at Jewish Chronic Disease Hospital in Brooklyn, New York. The hospital is presently conducting a special clinic for outpatient care of afflicted children, and is constructing a special ward for the care and observation of inpatient cases. Both of these programs are being conducted in conjunction with the laboratory research program of the Isaac Albert Research Institute of the hospital. A comprehensive genetic study is also being made of the pertinent hereditary patterns from histories supplied by the foundation and parents who have children under the care of the hospital. A counseling program is also offered.

The operation of the foundation is on a nationwide basis, and contact is being made for establishment of chapters in other metropolitan areas, in addition to the allied Tay-Sachs Association in Philadelphia. In order to further its work and; in particular, to prepare a substantial genetic study covering the entire country, physicians and hospitals are respectfully requested to make the existence of the foundation known to parents of children afflicted with these diseases.

For further information on the foundation and its work, write to Medical Committee, National Tay-Sachs Association, Inc., New York Chapter, P. O. Box 1250, G.P.O., New York 1, N. Y.

THE CIBA COLLECTION OF MEDICAL ILLUSTRATIONS

Publication of the third volume in the estimated nine-volume, twenty-year project to create for medicine the first definitive collection of authentic, full-color illustrations of every significant segment of the human body and diseases that affect it, was announced recently by CIBA Pharmaceutical Products Inc.

The artist of the entire series is the country's leading medical illustrator, Dr. Frank H. Netter of Norwich, Long Island. It was the popularity of Dr. Netter's full-color illustrations of normal and pathologic anatomy as teaching and reviewing aids that prompted CIBA to commission the publication of *The Ciba Collection of Medical Illustrations*. This unprecedented step was taken as a service to the medical profession without financial profit to the company.

The undertaking is so comprehensive and so vast that Dr. Netter will be devoting virtually the best of his productive years to completing it. Nine volumes, including several multiple issues,

such as the present section, have been planned. However, such painstaking detail, thorough research and wide collaboration are involved that it will take many years before the project will be completed. Two volumes have already been issued: "Nervous System" and Reproductive System."

Volume 3 is being developed in three parts. "Liver, Biliary Tract and Pancreas," just published, is actually Part III of this third volume. The decision to publish this section before Parts I and II was based on a survey which showed that the subject covered in Part III was second only to the nervous system in interest to the medical profession.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY

The next scheduled examinations (Part II), oral and clinical for all candidates will be conducted at the Edgewater Beach Hotel, Chicago, Illinois, by the entire Board from May 7 through 17, 1958.. Formal notice of the exact time of each candidate's examination will be sent him in advance of the examination dates.

Candidates who participated in the Part I examinations will be notified of their eligibility for the Part II examinations as soon as possible.

COMMITTEE URGES WIDER USE OF TB VACCINE (BCG)

In spite of the dramatic drop in deaths from tuberculosis in recent years, the disease continues to be a major health problem in many areas.

One way of combatting the problem—mass vaccination of susceptible persons with BCG vaccine —was recommended in an article and editorial in the June 29 Journal of the American Medical Association.

The article was prepared by the medical advisory committee of the Research Foundation of Chicago. The foundation helps other organizations and individuals in developing methods and materials for preventing tuberculosis.

BCG vaccine derives its name, Bacillus Calmette-Guerin, from two French scientists who pioneered its development 30 years ago. Given to healthy persons, the vaccine causes the body to develop immunity to tuberculosis. Revaccination is necessary about every four years.

Some 150 million persons have been vaccinated with BCG throughout the world, and in many countries BCG vaccination is mandatory. Extensive studies have shown a "marked reduction" in the incidence of tuberculosis in vaccinated persons as compared with nonvaccinated persons.

BCG vaccination has not been used extensively in the United States, even though the American Trudeau Society has recommended that it be used for those individuals who will be unavoidably exposed to tuberculosis.

COUGH-SUPPRESSANT DRUG

Persistant and severe coughing can now be practically stopped in its tracks by a completely safe drug called noscapine, which has a unique advantage in that it can be taken repeatedly or in increased doses by all types of patients, young or old, without ill effect.

The news that the long search for such an effective, non-addicting cough-suppressant has been successful was disclosed by the Voice of America during a recent interview with Commissioner Harry J. Anslinger, U. S. Representative to the United Nations Commission on Narcotic Drugs, and Chairman of the Commission at its 12th Session.

Commissioner Anslinger cited a report to the Commission by Dr. Nathan B. Eddy of the U. S. Public Health Service in which Dr. Eddy stated that noscapine is as effective for cough relief as codeine, the long . recognized standard for anti-cough remedies, and does not cause unpleasant effects. Moreover, such effects are not incurred even when the dosage is increased, if the occasion requires it. The Eddy report also declared that these advantages are particularly important for chronic coughers who must have relief over a long period of time.

With respect to stepping up the dosage, a spokesman for Merck & Co., Inc., which manufactures noscapine under the brand name 'Nectadon', declared that clinical results show that the dosages can be greatly increased without a proportionate increase in side effects, thus permitting wider medical use of a potent cough-suppressant in the treatment of chronic coughing. No other potent anti-cough drug is known to have this combination of valuable properties.

The Eddy report also noted that while noscapine (which is actually an old drug formerly called narcotine) is a natural ingredient of opium, it is chemically different from morphine and its derivatives. It has been proved through experience and specific tests to be completely safe and non-addicting.

CERVICODORSAL OUTLET SYNDROME DESCRIBED IN JOURNAL

Sewing pajama sleeves to the pajama coat and tying the wrists to the foot of the bed with a long piece of gauze were suggested today as treatment for a disorder known as "cervicodorsal outlet syndrome."

Cervicodorsal outlet syndrome is an all-inclusive term referring to hand, arm, and shoulder symptoms resulting from pressure in the cervicodorsal outlet—the region in which the nerves and vessels leave the neck and thorax and are transmitted to the arm.

One of the commonest predisposing factors is the prolonged elevation of the arms, particularly

sleeping with them above the head, Dr. Paul A. Nelson, Cleveland, said in the April 27 Journal of the American Medical Association.

To avoid this position, he recommended that the pajama sleeves above the elbow be sewed to the coat or that wrists be tied to the bedpost with a long piece of gauze. The gauze should be slack enough to allow the arms to move to all positions except above the head.

The syndrome occurs more often in women than in men and most frequently in the 20-to-40 age bracket, he said. It is frequently found among persons engaged in such occupations as hairdressing, painting, construction work, and switchboard operation.

The symptoms of the common form include aching, pain, numbness, coldness, tingling, "pins and needles," weakness or a dragging feeling, usually in the inner side of the hand but occasionally in the arm, shoulder, chest wall, and neck. In more serious cases there may be changes in the appearance of the hand, weakness of certain muscles, and swelling near the base of the neck.

MORE RESEARCH NEEDED IN COSMETIC FIELD

As cosmetics leave the "realm of luxury" and become items of necessity, more and better research into the fundamental properties of the skin also becomes a necessity, according to a Federal Food and Drug Administration official.

Dr. Arnold J. Lehman, chief of the FDA division of pharmacology, Washington, D.C., said the increasing demand for cosmetics has led to the new use of many known substances and the development and extensive manufacture of new synthetic compounds.

He made his statements in a guest editorial in a recent (May 25) Journal of the American Medical Association.

Unfortunately, carefully controlled research into the fundamental principles of skin properties and mechanisms and the actions of various chemicals and drugs on the skin has "not kept pace" with the many new products and the claims made on their behalf, he said.

Certain unobjectionable claims have been advanced for the effectiveness of certain preparations for reducing skin dryness and hiding skin blemishes and wrinkles.

However, in recent years the trend has been to advertise such products as being more than just cosmetics—that they serve as "skin foods, rejuvenators or tonics," "contour creams" for bust development or bust reducing, wrinkle eradicators, and "deep pore" cleansers.

"To date, however, no conclusive evidence has been offered in support of many of these claims," he said. "For example, there is nothing known to science that will restore color to hair or cure early male baldness."

STUDY SHOWS "PATCHWORK" OF CHEMICAL LAWS

A recent American Medical Association study showed a "patchwork" of state and federal laws regarding the labeling of hazardous chemicals, and pointed up the need for a uniform law.

Bernard E. Conley, Ph.D., secretary of the A.M.A.'s committee on toxicology, said his committee and the A.M.A. law department conducted the study in preparation for drafting a model chemical labeling law. A fall conference of interested parties in government, industry and medicine is planned to draft the model law, which will then be submitted to legislative bodies.

The proposed legislation is intended to reduce careless and ignorant handling of potentially harmful products in and around the home, in small businesses and in other areas where control of over-exposure to chemicals is not as efficient as in the manufacturing process, Conley said.

The law will require informative labeling, including listing of possibly harmful ingredients, their potentialities for harm, directions for safe use, and first-aid instructions.

At present all the states require labeling of narcotics; 93 per cent of drugs, and 85 per cent of pesticides. However, only 52 per cent require labeling of caustics and 10 per cent of industrial chemicals. Only New York, Indiana, Kansas and Connecticut regulate hazardous substances in household products.

At the national level, there are several chemical laws, including the Food, Drug and Cosmetic Act of 1938; the Insecticide, Fungicide and Rodenticide Act of 1947, and the Federal Caustic Poisons Act of 1927. In addition, the Interstate Commerce Commission and the Post Office Department have regulations regarding labeling, uses and transportation of chemicals.

The hodge-podge of laws is confusing and leads to ommission of many necessary regulations, Conley said. For instance, only 10 of 25 state caustic acid laws are similar to the Federal Caustic Poisons Act. The federal act itself is limited to only 12 caustic and corrosive acids and alkalies in specified concentrations, of which some are known to be hazardous in lower concentrations. In addition, many dangerous acids and alkalies are not even included in the law.

Of 46 states with drug laws, only 19 conform to the Federal Food, Drug and Cosmetic Act of 1938, even though 40 per cent of all drugs sold are confined to intrastate commerce, Conley said.

WOMAN'S AUXILIARY TO THE LOUISIANA STATE MEDICAL SOCIETY

The Woman's Auxiliary to the Orleans Parish Medical Society entertained the members and their guests at a gala Christmas party on Wednesday, December 11th, at 2:30 in the afternoon, at the Orleans Club on upper St. Charles Avenue.

The president, Mrs. Eugene H. Countiss, presided at a short business meeting preceding the program tea.

Mrs. Charles Farris, Jr., program chairman, introduced Mr. James W. Barr, Director of the Better Business Bureau of New Orleans, who was the guest speaker. His topic was "How To Save Your Christmas Shopping Dollar".

The members joined in group singing of Christmas carols with Mrs. Daniel W. Beacham accompanist at the piano.

Receiving in the drawing room with Mrs. Countiss were Mesdames Monte Meyer, Frank S. Oser, Jr., Nicholas Chetta, Fred O. Brumfield, Daniel W. Beacham, L. Sidney Charbonnet, Jr., and Robert C. Kelleher.

The tea table, centered with a beautiful arrangement of poinsettias and yuletide greens, was presided over by Mrs. Branch J. Aymond and Mrs. Carl N. Wahl.

The pretty and charming young daughters of the members served as tea girls: Patricia Ann Habeeb, Peggy Pavy, Diane Neal, Diane Alldredge, Sue Pavy, Shannon Brumfield, Barbara Beacham, Karen Oser, Ann Bradley, Kris Oser and Margaret Beacham.

Mrs. Branch J. Aymond,
Publicity Chairman.

BOOK REVIEWS

The Menninger Story, by Walker Winslow. Garden City, New York, Doubleday & Company, Inc., 1956, pp 350, Price $5.00.

This is the story of the growth and materialization of an idea, an idea which came to a physician in a small community. Dr. Charles Frederick Menninger, father of Drs. Karl and Will Menninger, so well known today, himself a diagnostician of note visited the Mayo Clinic in 1908, and was inspired by the idea of bringing medical care to his own community such as that offered in Rochester. Through the years and with the help of his two physician sons, this dream evolved and materialized to become one of the world's best known centers for the study of psychiatry and the care of mental patients. The history of this Clinic is the story of the Menningers themselves. It is an authoritative and absorbing account of a remarkable family and institution.

MARY LOUISE MARSHALL

Studies in Topectomy; by Nolan D. C. Lewis, Carney Landis and H. E. King (eds), New York Grune & Stratton, 1956, pp. 248, $6.75.

This is the third report in a series describing the results of the psychosurgical operation known as topectomy. As in the two preceding reports ("Selective Partial Ablation of the Frontal Cortex" and "Psychosurgical Problems"), the approach is a multidisciplinary one, including the services of cooperating teams of neurosurgeons, psychiatrists, psychologists, physiologists, social workers, etc. There were 66 brain operated patients studied, and 29 comparable, unoperated patients served as controls. The separate chapters in the Monographs describe the effects of either the *orbital* or *superior* topectomy upon the patient group. These chapters include the surgical procedure, physiological effects, vestibular function, autokinesis, psychometric studies, complex mental functions, time sampling study of activity, psychophysiology, sexual behavior, psychiatric effects, independent psychiatric evaluation and social service. In addition to providing information extending the earlier findings made by the Columbia-Greystone group, the present study introduces two new techniques of evaluation: a study of activity by time sampling methods, previously successfully employed in a study of primate behavior but never with man; and the study of the sexual behavior of the patients by the methods worked out by Professor Kinsey and his associates.

The unique importance of a situation permitting the study of human patients *before* as well as after cortical damage lends this study, like its predecessors, great value in our efforts to understand the mechanisms of the operation of the human brain. There is much of value for the reader of each of the disciplines comprising this investigative undertaking, as well as those whose interest lies in brain surgery.

KATHLEEN M. YOUNG, PH.D.

PUBLICATIONS RECEIVED

Grune & Stratton, Inc., N. Y.: The Physiologic Basis of Gastrointestinal Therapy, by Heinrich Necheles, M. D., and Martin M. Kirshen, M. D.; Bone Diseases in Medical Practice, by I. Snapper, M. D.

Louisiana State University Press, Baton Rouge: Nuclear Energy in the South, edited by Redding Sugg, Jr.

The C. V. Mosby Co., St. Louis: Symposium on Diseases and Surgery of the Lens, by George M. Haik, M. D., Elizabeth M. McFetridge, M. A., and Don Alvarado, Art Editor.

Charles C Thomas, Publisher, Springfield, Ill.: Liver-Brain Relationships, by Ian A. Brown, M. D.